Ottawa Valley Forest
Independent Forest Audit
2003-2008

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1.0 EXECUTIVE SUMMARY

This audit report for the Ottawa Valley Forest is the result of an Independent Forest Audit (IFA) conducted by KBM Forestry Consultants Inc. under contract to the Ontario Ministry of Natural Resources (MNR). MNR's Class Environmental Assessment Approval for Forest Management on Crown Lands in Ontario (2003) (EA Declaration Order) requires that all Crown forests in Ontario undergo an IFA. Regulation 160/04 of the Crown Forest Sustainability Act sets out the specific requirements for conducting the audits.

Ottawa Valley Forest Inc. (OVFI) is the Sustainable Forest Licence (SFL) holder and, together with MNR Pembroke District, were the principal auditees. MNR Regional and Corporate organizational units and contractors are also considered auditees to the extent that forest management activities carried out by them are the subject of audit examination.

The audit covers the five-year period April 1, 2003 to March 31, 2008 and includes two Forest Management Plans (FMPs); specifically implementation of planned operations during the last three years of the 2001-06 Ottawa Valley Forest FMP and planning of the 2006-11 Ottawa Valley Forest FMP, including implementation of the plan during the first two years.

The purpose of the IFA is to assess compliance to FMPs and legislated requirements, compare planned to actual activities including effectiveness, assess compliance to licence conditions, and the effectiveness of action plans resulting from previous audits. The EA Declaration Order also permits auditors to examine any matter directly related to forest management planning and forest management activities on the management unit. The audit led to nine Recommendations and identified one Best Practice. Key findings arising from the audit are discussed below.

The audit team found a high level of compliance and performance with requirements. The planning, implementation and reporting exceeded the requirements in most instances. This performance is noteworthy given the complex terrain, forest cover and market conditions associated with the Forest.

The compliance program in Ontario has made considerable progress over the years and is producing excellent results. Both MNR and OVFI execute compliance plans in a diligent fashion on the Forest. The compliance and silvicultural effectiveness monitoring programs are comprehensive, professionally delivered and achieving the desired outcomes.

There were significant differences in interpretation of the results of compliance programs over a relatively long period of time, including the previous audit period. Although considerable progress was made in addressing this issue on many fronts, and in particular in assessing Free to Grow candidate stands, OVFI and MNR still have substantial challenges ahead in agreeing on what constitutes acceptable practices in forest access, harvest and renewal activities. The two parties to the SFL operate with mutual respect and exercise professionalism but there is a lack of trust and empathy that lie at the root of the problem.

SFLs in Ontario have been highly successful in delivering a cost effective and accountable forest management program. Most of the activities that deliver both private and public goods and services are paid for by timber revenues to operate the SFL and public revenues to operate MNR. Although MNR provides "in kind" services to the SFL such as science and information programs, the continued depressed timber markets may limit the viability of SFLs in the future. The audit team believes that the current funding formula for SFL administration and MNR's provision of in-kind support must be reviewed.

The audit team was concerned with a situation in which MNR is making payments into the Forest Renewal Trust on the Ottawa Valley Forest to cover stumpage arrears of some overlapping licensees. The audit team strongly suggested MNR adopt a revised approach to collecting stumpage charges that guarantees the renewal portion of monies owed are paid.

The audit team concluded that management of the Ottawa Valley Forest was generally in compliance with the legislation, regulations and policies that were in effect during the term covered by the audit, and the Forest was managed in overall compliance with the terms and conditions of the Sustainable Forest Licence held by Ottawa Valley Forest Inc. Forest sustainability is being achieved, as assessed through the Independent Forest Audit Process and Protocol. The audit team recommended the Minister extend the term of Sustainable Forest Licence 542529 for a further five years.

Rod Seabrook, CEA(SFM), EMS(LA) – Lead Auditor on behalf of the Audit Team

2.0 INTRODUCTION

This audit report presents the results of the Independent Forest Audit (IFA) conducted by KBM Forestry Consultants Inc. (KBM) on the Ottawa Valley Forest for the five-year period from April 1, 2003 to March 31, 2008.

2.1 Audit Process

The Independent Forest Audit Process and Protocol (IFAPP) was developed by MNR to provide a comprehensive and consistent method of evaluating forest management activities on Crown land. The IFAPP states that the purpose of an Independent Forest Audit is to:

a) assess to what extent forest management planning activities comply with the Forest Management Planning Manual and the *Crown Forest Sustainability Act*;
b) assess to what extent forest management activities comply with the Act and with the forest management plans, the manuals approved under the Act and the applicable guides;
c) assess the effectiveness of forest management activities in meeting the forest management objectives set out in the forest management plan, as measured in relation to the criteria established for the audit;
d) compare the forest management activities carried out with those that were planned;
e) assess the effectiveness of any action plans implemented to remedy shortcomings revealed by a previous audit;
f) review and assess a licensee's compliance with the terms and conditions of the forest resources licence.

The IFAPP is based on eight guiding principles and contains 158 procedures, 136 of which are applicable to the Ottawa Valley Forest (the Forest). The audit procedures serve as a framework to provide a structured approach to evaluating whether or not forest management activities meet the requirements governing forestry practices on Crown land in Ontario.

MNR categorized the various IFA procedures based on complexity and their potential impact on forest sustainability. The IFAPP directs the audit team to assess through sampling, per audit principle and associated criteria, the three categories of procedures as follows:

- Administrative procedures – low risk: 20-30%
- Administrative but also having a bearing on sustainable forest management – medium risk: 50-75%
- Procedures directly related to sustainable forest management – high risk: 100%

The lower range of the sample scale may be considered for forests certified in accordance with a sustainable forest management standard accepted by Ontario. The Ottawa Valley Forest does not currently have such certification. Table 1 summarizes the number of procedures selected for audit based on the direction provided by the IFAPP.

Table 1. Sampling outcome for low and medium risk audit procedures.

Guiding Principle	Low Risk Procedures			Medium Risk Procedures		
	Applicable	Selected	% Audited	Applicable	Selected	% Audited
1	0	0	-	2	1	50
2	0	0	-	6	5	83
3	6	3	50	12	9	75
4	1	1	100	1	1	100
5	0	0	-	1	1	100
6	0	0	-	7	4	57
7	0	0	-	2	1	50
8	0	0	-	4	3	75

Note: all applicable high risk audit procedures were audited.

The previous IFA conducted on the Ottawa Valley Forest occurred in 2003. Twenty-three recommendations arose from that audit and the actions to address the recommendations were examined during the course of this audit. The audit process for the Forest consisted of seven components:

1. Audit Plan: KBM prepared an audit plan that described the schedule of audit activities, audit team members and participants, and auditing methods. The audit plan was submitted to MNR, Ottawa Valley Forest Inc. (OVFI), the Forestry Futures Trust Committee (FFTC), and the Chair of the Ottawa Valley Forest Local Citizens Advisory Committee (LCAC).

2. Public Consultation: Through individual letters mailed in early August, KBM advised all current Ottawa Valley Forest LCAC members that an audit would take place and invited their input. Two LCAC members accompanied the auditors for one day each during the field audit. The audit team attended a LCAC meeting on September 29, 2008, to discuss the audit and any concerns the LCAC members might have about the Forest.

   Newspaper ads were published in eight area newspapers (see Appendix E) prior to the pre-audit meeting advising the public of the upcoming audit. As per the requirements of the IFAPP, the notices identified the purpose of the audit and invited the public to submit comments to a representative of the LCAC or directly to KBM.

   KBM also prepared a one page mail-out survey to solicit public input to the audit process. The survey, in addition to a general letter informing contacts of the audit, was mailed to all businesses and organizations, and a representative sample of one-third of the individuals listed in the Forest Management Plan (FMP) mailing list (as provided by MNR Pembroke District). This list includes tourist operators, private land owners, trappers, baitfish licence holders, bear management area holders, local municipalities and government agencies, independent loggers, logging contractors, shareholders and other special interest groups. The survey was also available to the general public on the KBM website (www.kbm.on.ca).

   A total of 24 responses were received from the public as a result of either the newspaper ads or the survey. A summary of public consultation is presented in Appendix E – Summary of Input to Audit Process, which also includes a copy of the survey and newspaper notices.

3. The MNR Pembroke District Aboriginal Liaison provided KBM with contact information for each Aboriginal Community within or adjacent to the Ottawa Valley Forest and who participate in activities on the Ottawa Valley Forest. A letter was sent out to each of the Aboriginal communities on the contact list inviting them to participate in the IFA of the Ottawa Valley Forest. The letter asked for their input and encouraged them to contact KBM if they wished to

participate in the audit or if they required more information before making a decision. KBM also offered to arrange in-person meetings with the Aboriginal Community. Follow-up phone calls were made when necessary to encourage a response. A summary of discussions with Aboriginal communities is presented in Appendix E – Summary of Input to Audit Process and comments are also included in Section 3.2.5 where appropriate.

4. Field Site Selection: The audit team conducted a preliminary site selection prior to meeting with OVFI and MNR staff. Annual Work Schedules (AWSs) and Annual Reports (ARs) were used to ascertain the amount and type of forest operations carried out on the Forest during the audit period. A stratified random sample of sites was then selected to ensure that selected sites were representative of a cross section of all activities conducted on the Forest during the audit period. A pre-audit meeting was held in Pembroke on August 11-12, 2008. A portion of the pre-audit meeting was spent working with OVFI and MNR to refine the preliminary site selection and develop an itinerary for the field portion of the audit. Further discussion took place between KBM and the auditees before the sample of field sites was finalized.

5. Pre-audit Document Review: Prior to the eight day site visit, the audit team reviewed documents provided by OVFI and MNR, including the:

    - Ottawa Valley Forest 2001-06 and 2006-11 FMPs
    - Annual Work Schedules and Annual Reports associated with the above FMPs
    - Conclusions of the 1996-01 Report of Past Forest Operations (RPFO)
    - Comparison and Trend Analysis of Planned versus Actual Forest Operations Report (TAR)
    - Report of the Independent Forest Audit of the Ottawa Valley Forest conducted in 2003
    - Action Plan and Status Report on the Action Plan for the 2003 Independent Forest Audit of the Ottawa Valley Forest

6. On-Site Audit: The objectives of the field site visits were to confirm that activities were conducted according to plan, that they conformed to provincial laws, regulations, and guidelines, and that they were effective. The opening meeting was held in Pembroke on September 29, 2008. The audit team conducted interviews with staff of OVFI and MNR, with LCAC members, and with representatives of local Aboriginal communities. The audit team examined documents, records, and maps at the OVFI and MNR offices, and spent three days in the field viewing selected sites with representatives of OVFI, MNR District, Region and Forest Management Branch, LCAC, and a representative of the FFTC. Many stops provided the opportunity to audit multiple operations such as harvesting, renewal, values protection, etc. KBM committed to, and surpassed, a minimum sampling requirement of 10% of key activities and operations conducted on the Forest during the audit period. Table 2 presents the sampling intensity of the field site visits completed on the Forest. A sample of all key forest management activities was examined on the ground. Table 3 identifies the Overlapping Forest Resource Licence (OFRL) holders associated with specific field sites viewed by the audit team. To facilitate the audit, the audit team relied on a helicopter to reach certain field sites. Figure 1 presents the locations of the field sites. The closing meeting was held in Pembroke on October 6, 2008. This meeting provided a forum for the audit team to present and discuss preliminary audit findings with OVFI and MNR.

Table 2. Audit sampling intensity for the Ottawa Valley Forest.

Activity	Total Area/Number[1] (2003-2008)	Area/Number Sampled	Percent Sampled
Harvest (ha)	19,181	3,808	20
Renewal & Maintenance (ha)	12,196	2,378	19
Free–to-Grow (ha)	4,751	1,133	24
Area of Concern Categories[2] (#)	22	10	45
Road Construction/maintenance (km)	439	50	11
Road Maintenance Agreement (2007-08) (km)	191	32	17
Specified Procedures Review[3] (ha)	5,369	1,102	21

[1] The amount of area for the 2007-2008 year was estimated from the average annual value of the previous four years.

[2] Area of Concern categories refer to the different types of AOCs present on the Forest. Examples include riparian reserves, cold water fisheries, and osprey nests. More than one AOC was associated with most sites selected for review of harvest and renewal operations. In addition, some sites were specifically selected to represent a cross-section of AOCs.

[3] KBM reviewed maps, records, and fieldwork associated with the Forest Renewal Trust Account Specified Procedures Review for 2006-07.

Table 3. OFRLs associated with field stop locations viewed during the field audit.

Overlapping Forest Resource Licence Holder	Stop #
Commonwealth Plywood, (R.F. Shalla and Son)	1
Commonwealth Plywood, (R.F. Shalla)	2
BMSFA – (Felhaber Brothers)	3
Murray Brothers Logging Company Ltd., (Chartrand Sand and Gravel)	4
Murray Brothers Logging Company Ltd., (Ernie Trebinski)	5
Murray Brothers Logging Company Ltd., (Tim Shutt)	6
T.J. Neuman Ltd., (Trevor Lidtlke Logging)	7
Herb Shaw and Sons	13
John Stewart Forest Products Ltd.	17
Ben Hokum and Son Ltd. (John Stewart Forest Products Ltd.)	19
Ben Hokum and Son Ltd. (John Stewart Forest Products Ltd.)	20
Hec Clouthier and Sons Inc.	22
Hec Clouthier and Sons Inc.	25
Hec Clouthier and Sons Inc.	26
Hec Clouthier and Sons Inc.	27
Ben Hokum and Son Ltd. (John Stewart Forest Products Ltd.)	29
Ben Hokum and Son Ltd. (John Stewart Forest Products Ltd.)	31
BMSFA (M.W. Miller)	34
BMSFA (M.W. Miller)	35
BMSFA (M.W. Miller)	36

*Contractor who operated on the site is identified in brackets where different than OFRL holder.

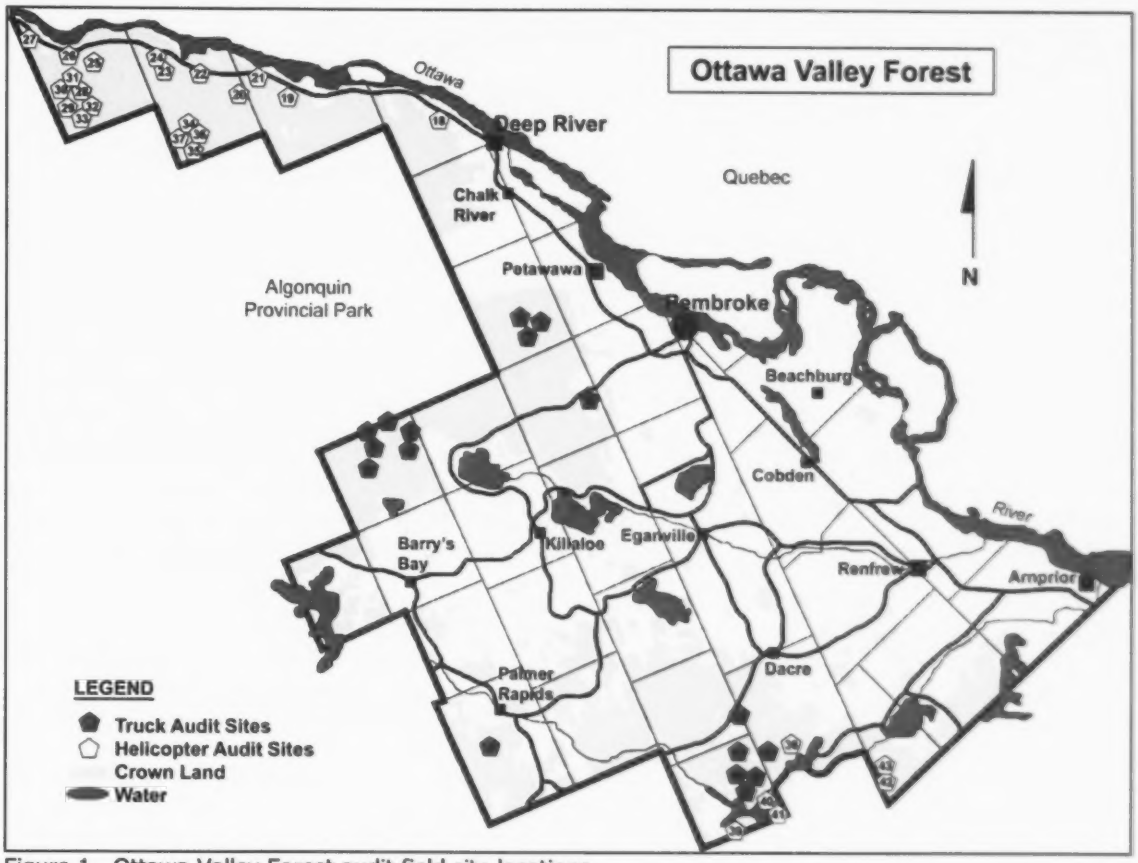

Figure 1. Ottawa Valley Forest audit field site locations.

7. Final Report: The audit results are presented in this report following a brief description of the audit process and the forest licence area under review. Within the report the audit team has made recommendations to address instances of a non-conformance to a law and/or policy, or an identified lack of effectiveness in forest management activities. Recommendations from this audit must be addressed in an action plan developed by OVFI and MNR District, with input and review by MNR Regional and Forest Management Branch representatives. MNR Regional and Forest Management Branch representatives will also develop an action plan to address any recommendations applicable to matters of forest management within the scope of responsibilities of these departments.

   Suggestions are no longer highlighted in audit reports, nor will they be addressed in action plans. Any suggestions of the audit team have been incorporated within the regular text of the report. Best Practices are identified when highly effective or novel approaches to various aspects of forest management are observed on the Forest.

2.2 Forest Management Context

The Ottawa Valley Forest is licensed to OVFI under Sustainable Forest Licence (SFL) No. 542529, which came into effect April 14, 1999. OVFI was formed by a partnership of interested companies and by authority of the SFL, is responsible for forest management planning and the implementation of forest management activities on the Forest. The operation of the company, including the distribution of the harvest allocation, is governed by a Unanimous Shareholders Agreement.

The audit assessed implementation of the last three years of the 2001-06 Forest Management Plan (FMP) and the first two years of the 2006–11 FMP, including its planning process and approval. Throughout this audit report the audit team's reference to "the Company" also refers to OVFI. As the managers of the Ottawa Valley Forest, the principal auditees are both OVFI and the Pembroke District Office of MNR. Other auditees include shareholders, contractors and other branches of MNR to the extent that forest management activities carried out by them are the subject of audit examination.

2.2.1 Location of the Forest

The Ottawa Valley Forest is located in the MNR Southern administrative region. The boundaries of the Ottawa Valley Forest coincide with the municipal boundaries of Renfrew County and with the boundaries of the MNR Pembroke District. The location of the Ottawa Valley Forest with respect to MNR's jurisdictional boundaries in the Southern Region is illustrated in Figure 2.

Figure 2. Location of the Ottawa Valley Forest with respect to MNR's Southern Region jurisdictional boundaries.

2.2.2 Description of the Forest

The information in this section was derived from the 2006-11 FMP for the Ottawa Valley Forest.

The total area of the Ottawa Valley Forest, all ownerships combined, is 806,298 ha. Crown lands and waters comprise 326,550 ha, or 40% of the management unit while patent (private) lands account for almost 55% of the landbase. The remaining 5% is classed as Other (First Nation reserves, Federal lands). Excluding water, Crown lands make up 31.7 % of the management unit. There are 15,239 ha (6%) of Crown lands in regulated parks and protected areas. The balance of Crown lands, 240,733 ha (94%) is considered to be the Managed portion of the Ottawa Valley Forest. Of the Managed lands, 237,413 ha (98.6%) are considered forested, of which 216,269 ha of Production Forest are suitable for timber management. This is the equivalent of nearly 27% of the land within the boundaries of the Ottawa Valley Forest.

Canadian Forces Base Petawawa, the Petawawa Research Forest and the Chalk River Nuclear Research Facility lands lie within the Ottawa Valley Forest boundaries. A significant portion of this federal land is forested and managed for forestry purposes however, the forest resources inventory does not include any description of these forest stands to add to the management unit context. The result is a significant and artificial gap in the landscape between the northern and southern portions of the management unit.

An important bedrock feature of the broader regional landscape is the Algonquin Dome and its influence on the climate of the region. Tremendous pressure changes deep within the earth are believed to have caused broad warping of the earth's crust in an arch from Georgian Bay to the Ottawa River and in an arch from the Adirondacks north-westward through Algonquin Park. The Algonquin Dome creates a rain shadow effect on its eastern flank, reducing the mean temperature and growing season at higher elevations. This contributes to a minor representation of tree species more common to the Boreal Forest Region such as jack pine and black spruce, particularly in the northern portion of the unit. Drought-resistant white pine, red pine, red oak, largetooth aspen and white birch benefit from the rain shadow effect of the Algonquin Dome. Tolerant hardwoods such as hard maple, beech, and yellow birch are generally most successful at the higher elevations in the south-west portions of the management unit where there is greater precipitation.

Most of the managed lands in the Ottawa Valley Forest occur in the Algonquin Highlands, a physiographic region defined by the broad dome-shaped highlands of the Algonquin Dome that dominates central Ontario. The bedrock-controlled topography of the Algonquin Highlands is comprised of rough, rounded knobs and ridges usually standing 15 to 60 metres high, but occasionally rising as much as 150 metres.

The bedrock in the northern half of the management unit is dominated by hard, acidic, coarse-grained and slow to weather granites and granite-gneisses. The southern part of the unit contains rock that is generally softer, finer grained and less resistant to weathering. Shallow glacial till over bedrock is the most common landform feature in the Ottawa Valley Forest. Localised deposits of glacial outwash sand and gravel are good sites for white and red pine and are an important source of road building materials.

Most soils founds to occur in the Forest are non-calcareous (lacking in calcium), inherently acid and relatively infertile and generally favour the growth of conifers (pines, spruces, hemlock and cedar). Largetooth aspen and yellow birch are two hardwood species that also prefer more acidic soils. There are some soils in the southern portion of the Forest that have significant calcium content. Calcium is not only an important plant nutrient, but it also works as a buffer to maintain pH levels in the soil. These soils have the potential to be more productive forest sites particularly for hardwoods, and they may support forest communities that are relatively unique in the Forest.

The current forest condition is shaped largely by the disturbances that have occurred since the 1900's. This is reflected in the current age class distribution of the Forest, with almost 80% of the forest stands being between 60 and 120 years of age. Many of the pine, poplar and oak stands that exist on the

Forest today would have originated from fires that occurred immediately before and after 1900, coinciding with the peak of sawmilling and settlement activity. Since the 1950's, when technological improvements in aviation, communications and other fire fighting tools, as well as improved forest access contributed to more effective fire suppression, there have been very few large forest fires on the Ottawa Valley Forest. Today, virtually every fire is detected and suppressed before it becomes more than a few hectares in size, essentially eliminating the natural role of fire on the Forest. The result is that low value shade tolerant species, such as red maple and balsam fir, have been gaining a foothold in the understory of many forest stands. The current forest landscape is dominated by forests of poplar, poplar - mixedwoods, white pine, red oak and hard maple. Hemlock and yellow birch are considered under-represented both as a species within stands and as a stand type in the Ottawa Valley Forest.

2.2.3 Forest Management Issues

The IFAPP requires a review of high priority aspects (HPAs) of the auditees' systems or activities. HPAs can include significant management challenges that are inherent to the unit or can be specific issues that have arisen during forest management planning or plan implementation. The auditor examined these aspects in detail during the review of documents and the site visit.

The audit team compiled a candidate list of HPAs based on discussions with staff of OVFI and MNR and a review of the 1998-2003 Ottawa Valley Forest IFA audit report, including the 2003 IFA Action Plan Status Report. The following summarizes these issues:

- Differences in interpretation between OVFI and MNR of the results of compliance inspections.
- Development of white pine regeneration under the shelterwood system.
- Accuracy of Free-to-Grow survey information submitted by OVFI.
- High level of age class substitution in the poplar allocation.
- Declining available harvest area.

The audit team examined the HPAs during the conduct of the audit and the results are discussed under the appropriate headings within Section 3.0 of the audit report.

3.0 SUMMARY OF AUDIT FINDINGS

3.1 Commitment

The criteria to determine whether the organization is committed to sustainable forest management is adherence to applicable legislation and policies. This commitment must also be reflected in corporate policy.

OFVI maintains a web page (http://www.ovfi.ca/index.php?pr=Policy) that displays the following commitment to sustainable forest management:

Vision:

A continued long tradition of social, economic and cultural benefits from healthy forest ecosystems in the Ottawa Valley.

Mission:

To deliver ecologically sustainable forest management, thus ensuring the heritage and tradition of Ottawa Valley Forest's natural resources.

MNR also maintains a web page with many links describing programs and policies regarding their commitment to sustainable forest management (http://www.mnr.gov.on.ca/). In addition, brochures and posters conveying these messages are found throughout the offices.

MNR and OVFI staffs are aware of these policies and all the documents and interviews showed a strong level of commitment to sustainable forest management in both organizations. Both organizations developed and implemented compliance plans to address adherence to applicable legislation and policies. The compliance program is discussed in greater detail in Sections 3.6.1 and 3.6.2.

3.2 Public Consultation and Aboriginal Involvement

3.2.1 Local Citizens Committee

The Ottawa Valley Forest LCAC is a standing Committee that assists in the preparation and implementation of forest management plans for the Ottawa Valley Forest. Audit team members attended a meeting of the LCAC during the site visit. At this meeting, the role and activities of the Committee during the audit term were discussed with LCAC members. Additionally, LCAC documentation was reviewed.

LCAC membership was reviewed by MNR at the start of the planning process for the 2006-11 FMP. Recruitment ads were published and five applications received. MNR attempted to secure a replacement for the previous snowmobile association representative with no success. There was no record of a formal review of LCAC membership occurring within six months of the effective date of the 2004 Forest Management Planning Manual (FMPM) as was required. However, membership was reviewed and discussed during the March 27, 2008 meeting in relation to the planning process for the next FMP. In light of this, the audit team has not issued a recommendation.

The LCAC membership over the audit period was reviewed and found to represent a fair range and balance of interests from the local communities within the Ottawa Valley Forest and is deemed to meet the intent of Section 3.2.3 of the 2004 FMPM. The LCAC has struggled with the ability to successfully recruit Aboriginal community representatives; on the other hand, Aboriginal community representatives have chosen to participate as members of the planning team, which is discussed further in Section 3.2.5. The audit team encourages MNR to continue to make attempts to recruit representatives of local interest groups and forest users not currently represented on the LCAC.

The LCAC terms of reference was reviewed and updated at the beginning of the 2006-11 FMP planning process as required. Based on a review of the meeting minutes, the LCAC terms of reference was not reviewed against the requirements of the 2004 FMPM as per the phase-in provisions of that manual. The audit team recognizes that the LCAC terms of reference will most likely be reviewed against the full requirements of the 2004 FMPM as part of the planning process for the next FMP; however, since this was not completed during the audit period, a recommendation is warranted.

Recommendation 1: District MNR must ensure that the LCAC Terms of Reference is updated to meet the requirements of the 2004 FMPM.

The LCAC met monthly during the development of the 2006-11 FMP after which the meeting schedule reverted to about three meetings a year plus any tours that the group requested. OVFI presents the AWS and AR annually to the Committee. MNR presents administrative amendments to the Committee on an annual basis for efficiency sake and as long as there is concurrence with the way MNR classified the amendments, the practice continues. MNR reminded the Committee there is a role for the LCAC to review amendments and provide advice to the District Manager regarding categorization of amendments. In most instances, no comments were received regarding any disagreement with the classification of amendments. The desire to be informed of significant blowdown events prior to the annual summary was expressed by a Committee member. As a result, in the fall of 2004, the LCAC was notified about the Flat Iron Lake blowdown event and associated amendment request for salvage operations when it occurred.

According to the LCAC report which formed part of the 2006-11 FMP, LCAC members are in agreement with the plan, and their concerns were addressed and possible solutions discussed throughout the planning process. The LCAC report provided an excellent summary of LCAC activities, decisions, and overall involvement in the 2006-11 FMP planning process and the audit team commends those involved in producing it.

Based on interviews with members of the LCAC, a review of LCAC meeting minutes and the LCAC report, the Committee was considerably involved in the development of the 2006-11 FMP. In addition to having a LCAC representative attend planning team meetings, the Committee as a whole participated in discussions about plan objectives and strategies, management alternatives, the demographic profile, reviewing values maps, reviewing public displays and participating in public information centres. The Committee had concerns about the apparent lack of awareness and education among the younger generations about forestry and forest management activities, particularly as young people become the new owners of forested private land within the boundaries of the Ottawa Valley Forest. A recommendation was made to the planning team and as a result an education objective was included in the plan. The LCAC complimented OVFI and MNR staff on their ability to break down the planning process into manageable sections and in particular, the plan author's ability to explain forest management concepts to Committee members.

MNR and OVFI staff members were in attendance at every LCAC meeting during the audit period to give presentations on various topics, often in response to requests from the Committee. MNR and OVFI also supported the interests of the LCAC by arranging guest speakers, field tours, training sessions, and fulfilling specific requests such as notifying the public about salvage operations that were occurring due to recent blowdown events and red pine decline.

When appropriate, issues raised by the public were brought to the LCAC for input and/or endorsement of proposed solutions. A review of LCAC meeting minutes confirmed these findings. For example, a LCAC representative had been involved in helping MNR and OVFI to resolve an issue some cottagers had regarding a harvest allocation planned near Spectacle Lake. The Committee was kept up-to-date on progress and some members attended a field tour of the area at issue. This specific issue is described in more detail in Sections 3.2.3 and 3.2.4 as it went through the issue resolution stage and lead to a request for an individual environmental assessment.

Other concerns the LCAC also shared with the audit team included the age of the inventory that OVFI had to work with in the development of the plan (see Section 3.3.3), lack of forest management on private lands that lie within the boundaries of the Ottawa Valley Forest; impact of herbicide use on watersheds; protecting/encouraging beaver habitat for trappers; the amount of planning time absorbed by bureaucratic processes; educating the public, specifically through the school system, about forest management; and succession planning for LCAC members.

In summary the audit team believes the LCAC fulfilled its role in the planning process and in monitoring the implementation of the 2006-11 FMP during the audit period.

3.2.2 FMP Standard Public Consultation Process

The 2006-11 FMP was prepared following the requirements of the 1996 FMPM, including the public consultation process. Consultation documentation was reviewed at the MNR office in Pembroke and interviews were held with MNR staff. MNR published the formal public notice in eight newspapers at every required stage of the process. In advance of each information centre, MNR placed an additional informal or "friendly" ad in the same publications hoping it would entice more people to participate. A review of LCAC meeting minutes indicated that LCAC members feel the public is generally satisfied with the way operations occur, and have been able to deal directly with MNR and/or OVFI staff on issues to negotiate a resolution; this being a possible explanation for the low attendance at information centres.

Direct written notices were mailed to contacts on the Pembroke District FMP mailing list at the required stages. Timelines associated with public consultation requirements were adhered to. In addition, direct written notice of the first and second public information centres was given to Ottawa Valley Forest licensees, Pembroke District MNR staff, the local field-naturalist club, and the Renfrew County Stewardship Council. Furthermore, MNR met requirements for posting public notices on the Environmental Registry.

The public consultation process was well documented including the record of public comments received and associated responses. Communication between OVFI and MNR regarding public comments received during the planning process was effective. Members of the planning team were available to answer questions from the public at both information centres and recorded the communication.

Most of the issues raised by the public were resolved directly by the plan author in cooperation with those concerned. When warranted, OVFI staff met with these individuals to discuss possible solutions and often visited specific sites that were at issue. MNR also actively participated in responding to comments received from the public and provided maps and other information as requested.

The audit team also reviewed the amendment records to determine if the public consultation process was implemented for any amendments processed during the audit period. FMP amendments categorized as either minor or major amendments require some level of public consultation to occur. There were 17 administrative amendments proposed to the 2001-06 FMP during the audit term and all but one were processed and approved. It was decided that a potential amendment regarding High Potential Cultural Heritage (HPCH) would be deferred until writing of the next (2006-11) FMP. There were no minor or major amendments to the 2001-06 FMP.

There were 15 amendments to the 2006-11 FMP during the audit period and all were categorized and processed as administrative amendments requiring no formal public consultation. Nonetheless, MNR and OVFI staff took advice from the LCAC to notify the public regarding the impacts of three recent natural disturbances that occurred on the Forest. In 2006, four amendments to the 2006-1 FMP were proposed and approved to implement salvage operations addressing blowdown, tornado damage, and a decline in the quality of red pine. Although the LCAC agreed that the amendments should be processed as administrative in nature to expedite the salvage operations, the Committee believed the public should be notified of what was occurring and why. In response OVFI and MNR staff spoke with *The Eganville Leader* for an article published on the impacts of recent natural disturbances and MNR produced a fact sheet for public distribution on the subject. The LCAC shared positive comments with the audit team with respect to the proactive manner in which OVFI and MNR staff met these requests.

OVFI contacted all licensed Resource-Based Tourism operators (RBTs) that operate on the Forest according to the list provided by the Ministry of Tourism, Culture and Recreation. Prior to the Invitation to Participate, 20 RBTs were invited to discuss the option of negotiating a Resource Stewardship Agreement (RSA). A total of eight responses were received and none felt that an RSA was required. Three RBTs requested Annual Work Schedule (AWS) information on forestry activities in order to assist in planning of hunting activities.

Owners of Spectacle Lake Lodge were contacted as part of the RSA process. OVFI met with the operator to discuss the specifics of potential allocations adjacent to Spectacle Lake and provided assurances that neither the trail network nor the view of the landscape would be affected by proposed operations. The operator declined the RSA process but suggested that OVFI contact the cottagers' association.

Spectacle Lake Cottagers raised concerns about a planned harvest allocation in the area and wanted assurances from OVFI that proposed logging operations would not impact municipal and/or private cottage roads by log trucks (noise, damage, and traffic); affect the lake or cottage properties and roads with increased surface run-off, or negatively impact landscape views. In May, 2005, the General Manager of OVFI met with cottage owners at Spectacle Lake Lodge to provide information on the FMP

process, the Company, and proposed operations. OVFI and MNR staff met with cottage owners during a field visit in September, 2005. At this time potential refinements to the harvest prescription based on the results of recent field work were discussed. OVFI and MNR made considerable investments in preparing presentations, conducting an analysis of visual impact of harvest, producing and distributing maps to concerned individuals, investigating options to modify operations to address the concerns, and coordinating field visits.

In October, 2005 an individual unable to participate in the previous two meetings rekindled the issue and became the group representative. The group contacted MNR and OVFI through their representative and reiterated their concerns. OVFI responded in writing outlining commitments the company was willing to make including using an alternate access route; implementing a winter harvest; increasing buffers on water courses and cottage roads; and adjusting forest operations prescriptions based on field survey results. Another on-site meeting was held in November, 2005 attended by MNR and OVFI staff and a number of cottage owners.

Despite the commitment of OVFI and MNR staff to resolve the concerns the issue went to issue resolution stage (see Section 3.2.3). The cottagers were specifically concerned with the lack of site-specific scientific proof that logging would not increase surface run-off that could cause damage to property and the lake and took the position that no logging should occur within the watershed east of Spectacle Lake. It is the opinion of the audit team that OVFI and MNR met their obligations with regards to the FMP standard public consultation process.

3.2.3 Issue Resolution

The last day to request issue resolution under the 2004 FMPM requirements is 30 days after the completion of the period for public review of the draft planned operations. Public review of the draft plan ended on November 23, 2005, therefore the last day to request issue resolution was December 23, 2005. The request from Spectacle Lake Cottagers came in November, 2005, during the Draft Plan Review stage so the issue was directed immediately to the District Manager as per the 2004 FMPM.

The Pembroke District Manager rendered a decision on December 5, 2005, notifying Spectacle Lake Cottagers that harvesting could occur as planned and of the deadline to exercise their option to request a review of the decision by the Regional Director. In the decision the District Manager stated that concerns identified by the cottagers were not supported by the best scientific information available or professional opinions and that OVFI had made concerted efforts to address the concerns.

On December 28, 2005, Spectacle Lake Cottagers requested that the Regional Director of MNR Southern Region review the request. In mid-January 2006, the Regional Director met with representatives of MNR, OVFI, LCAC, and the Spectacle Lake cottagers on-site. The Regional Director provided a decision at the end of January, 2006, finding that OVFI met their obligations to consult, that significant effort was invested *in responding to or mitigating all concerns* that were raised in a *timely, proactive and constructive* manner. Further, the Regional Director determined that harvest operations could occur as planned, including the modifications already agreed to by OVFI, but included an increase in the size of the buffer behind the properties. The cottage owners were also notified of the opportunity to make a written request to the Minister of the Environment (MOE) for an individual environmental assessment during the 30-day period for public inspection following approval of the plan.

Despite efforts made by OVFI and MNR staff to work with the cottage owners towards a resolution, the concerned citizens were not satisfied with the outcome of the issue resolution process and made a written request to the Minister of the Environment for an individual environmental assessment of the proposed activities.

3.2.4 Individual Environmental Assessments

The Spectacle Lake Cottagers chose to make a formal request to the Minister of Environment for an individual environmental assessment (IEA) under the *Environmental Assessment Act* on March 1, 2006, within the timelines prescribed by the 2004 FMPM. Within days, the MNR Regional Director made a request to the MOE for concurrence of the 2006-11 FMP to allow for forest management operations outside of the area in question to commence as planned beginning April 1. On March 14, 2006, MOE agreed with concurrence to approve operations in the FMP, excluding the area under review. MNR notified OVFI of the decision. On March 21, MOE acknowledged receipt of the letter from the Spectacle Lake Cottagers to the group's representative, and in separate correspondence, requested from MNR information regarding the area and proposed operations under review to aid in the assessment. MNR responded within the required 15-day period. According to the FMPM, MOE will normally decide on the request within 45 days of the receipt of all necessary information from MNR. In this case MOE rendered its decision on January 24, 2007, over 270 days later. MOE denied the request for the IEA, thereby allowing operations to continue as planned in the 2006-11 FMP, including the modifications already agreed to by OVFI and the additional buffer proposed by the Regional Director. MNR formally notified OVFI of the decision in writing on February 6, 2007.

It took more time than prescribed in the FMPM to proceed through the IEA process. However, certain changes made to the process have allowed for decisions on these requests to be made in a timelier manner. In particular, an amendment to Declaration Order MNR-71 was made in 2007 that removed the decision-making powers on individual environmental assessment requests from the Minister of the Environment to the Director of the Environmental Assessment and Approvals Branch. A discussion with Corporate MNR indicated that this has since had a positive influence on the timeliness of decisions. In addition, MNR and MOE have made considerable efforts to coordinate their roles to find efficiencies in the process.

3.2.5 Aboriginal Involvement in Forest Management Planning

The IFAPP requires the auditor to assess whether reasonable efforts were made to engage each Aboriginal community in forest management planning and assess the resulting involvement and consideration in the plan. The auditor is also asked to review whether Aboriginal peoples were provided with, and whether they availed themselves of opportunities to achieve more equal participation in the benefits provided through forest management planning and assess the results.

As a result of the formal negotiations between the Algonquin communities and the Provincial and Federal governments, the number of Algonquin people that may have rights has increased in recent years. According to the Native Background Information Report included in the 2006-11 FMP as Supplementary Documentation "E", the increased numbers of those people being determined through their communities to be Algonquin has in turn resulted in an increase in use of the forest for other uses.

Over the past few planning periods, the number of Algonquin communities participating in the forest management planning process on the Ottawa Valley Forest also increased, with the potential to further increase when planning for the 2011-21 FMP begins. MNR recognized five Algonquin communities that have representation on the Algonquin land claim negotiating table during planning for the 2006-11 FMP.

MNR has the lead responsibility for Native Consultation (as termed in the 1996 FMPM) in the planning process. The Pembroke District has a Resource Liaison Person whose role is to lead aboriginal programs and initiatives within the Pembroke, Bancroft, and Kemptville Districts and act as the MNR representative in resource and issue negotiation with Aboriginal communities.

For the development of the 2006–11 FMP of the Ottawa Valley Forest which began in late 2003, there was a known interest from five Aboriginal communities. They include:

- Algonquins of Pikwakanagan
- Algonquins of Greater Golden Lake First Nation
- Bonnechere Algonquin First Nation
- Antoine First Nation
- Mattawa/North Bay Algonquins

Early in the planning process, MNR invited the five communities to participate and offered a number of ways in which this could be achieved. Options to participate included the standard public consultation process; the Forest Management Native Consultation Process; participating as a member of the planning team; participating as a member of the LCAC; participating in an Aboriginal Advisory Committee that could be created; or receive individual FMP updates to the community.

Four of the five communities opted to participate as a member of the planning team, while the Algonquins of Pikwakanagan chose to receive regular FMP updates. The community's participation is discussed later in this section. A review of the planning team minutes and interviews with two community representatives confirmed this.

All five Aboriginal communities were invited to participate in the preparation of a Native Background Information Report to identify the interests of their respective communities as required by the 1996 FMPM. Funding to help offset the cost to the community of producing the report was provided by MNR and reports were received from four communities. MNR used the information contained in those reports to produce the Native Background Information Report which was included in the 2006-11 FMP as Supplemental Documentation "E". The individual reports are deemed confidential and MNR agreed to restrict access to the reports to assist in protecting the integrity of any identified values.

The contribution of Algonquin community representatives to the planning team was generally positive and welcomed by MNR and OVFI. Community representatives expressed interest in participating in the AOC task team and having access to planning team training opportunities; these requests were honoured by the planning team. In addition the planning team incorporated the protection of values identified by community representatives. For example, wild leek was identified to the planning team as a value and has been identified as a Locally Featured Species in the 2006-11 FMP (FMP Section 2.2.5.9.2). The planning team worked together to agree on a means of addressing a number of small, isolated areas identified by the High Potential Cultural Heritage (HPCH) exercise. Algonquin community representatives who participated in field verification exercises were compensated for their time by OVFI and indicated to the auditor their appreciation of the opportunity.

There were some issues identified at planning team meetings which were captured in the Native Background Information Report and were also brought to the attention of the auditors during interviews. Some Algonquin community representatives were dissatisfied with the level of compensation provided to them for their participation on the planning team. MNR covers costs incurred to attend planning team meetings (i.e. mileage) and provides compensation in the form of per diems based on whether meetings run a half-day or full-day. At issue was MNR's policy to not provide additional compensation to Algonquin communities representatives for their participation on planning team task teams, or to compensate community representatives for meeting preparation time. For the current planning process (2011-21 FMP) compensation for task team participation for an Algonquin member is being made available. According to MNR, compensation for meeting preparation time is not available due to lack of funds.

MNR District raised a concern regarding how forest management planning funds are allocated for the involvement of Aboriginal communities. Specifically, funds are currently allocated to each community for the production of the Native Background Information Report with little or no standard for ensuring expectations of both parties are met. Interestingly, an Algonquin community representative also raised

issue with the amount of funding provided to produce the report, including identifying values, claiming that the amount is insufficient. The issue surrounding the allocation of funds has the potential to become more difficult as the number of communities who want to participate in the planning process for the next FMP increases (particularly if the amount of funding remains static or decreases). If MNR Pembroke District continues to follow the precedent it has set for this FMP, they will likely be offering a seat at the planning team to a total of nine Algonquin communities for the development of the 2011-21 FMP. The audit team suggests that Corporate MNR review its funding policies specific to providing support for the participation of Aboriginal communities in the forest management planning process.

Notwithstanding the preceding discussion, the audit team concludes that reasonable efforts were made by MNR and OVFI to engage the Algonquin communities in forest management planning based on the requirements of the 1996 FMPM.

The Algonquins of Pikwakanagan chose to receive regular FMP updates rather than participate on the planning team, due mainly to the community's existing capacity and involvement in forestry activities. Over the years the community has established their own forestry company which has seen some growth in recent years. In addition to a harvest allocation on the Ottawa Valley Forest, the community also has significant operations on the neighbouring Algonquin Park Forest. They have a full time office to administer the forestry activities and have a Registered Professional Forester on staff who is also a member of the community. Through its economic development corporation (Makwa Economic Development Corporation) the Algonquins of Pikwakanagan have held a harvest allocation in the Ottawa Valley Forest under Appendix F of the SFL since the 1996-01 FMP. The community reports that this was largely a result of Term and Condition 77 of the Environmental Assessment on Timber Management Planning for Ontario (1994), which is now Condition 34 of the Declaration Order[1]. Discussions with staff of Makwa Economic Development Corporation indicate that its operations on the Algonquin Park Forest have grown significantly, hence so has its resource commitment to that forest. Although much smaller in comparison, the allocation on the Ottawa Valley Forest plays a key role in keeping operators working year-round.

MNR and OVFI have been well aware of the desire of each Algonquin community to acquire a harvest allocation on the Ottawa Valley Forest. During a planning team meeting in October, 2004, the issue was raised during discussion surrounding the (at the time) potential FMP objective *To provide for participation in the harvest allocation by the Algonquin First Nations*. The result was an action item which indicated that:

> *Further discussions on harvesting and silvicultural opportunities for the Algonquin First Nation should be removed from the F.M.P. planning process and elevated to a separate forum involving the First Nations, [MNR Resource Liaison Person, MNR District Manager, OVFI General Manager, and MNR Area Supervisor].*

Over the next few months, some discussion took place however, not to the satisfaction of some of the Algonquin communities, specifically due to the fact that there were no harvest allocations granted to them. According to the 2006-11 FMP, the allocation and licensing of harvest area to Aboriginal interests other than those already administered by the Algonquins of Pikwakanagan is not possible for a number of reasons: 1) a decrease in the available harvest area (AHA) as determined through the forest management planning process; 2) a forecasted decrease in the AHA in future plan periods; and 3) the fact that the current harvest area is already completely allocated to existing licensees. MNR and OVFI are not willing to consider reducing an existing licensee's allocation in order to provide an opportunity to a new party. That is understandable given the potential business and political ramifications of that sort of undertaking. Furthermore, given the increase in the number of Algonquin communities over the past plan term, there is legitimate concern on MNR's and OVFI's part on how that can be addressed if the trend was to continue.

[1] MOE, 2003. Declaration order (MNR 71-2) regarding MNR's Class Environmental Assessment Approval for Forest Management on Crown Lands in Ontario.

In the 2006-11 FMP, MNR and OVFI describe certain efforts that have been taken to address the inability to meet the communities' requests for a harvest allocation. This includes MNR's offer to assist interested Algonquin communities with business planning and facilitating access to financial assistance. None have come forward. Two shareholders of OVFI committed to providing 350 ha of contract harvesting and renewal and tending work to any interested Algonquin community.

The audit team also reviewed the District Condition 34 reports provided by MNR which are to summarize the progress made within the District in meeting the obligations under Condition 34. Each annual report captured the activities of both OVFI and MNR. OVFI and MNR have supported the Algonquin communities through other initiatives such as employment, training, monetary and in-kind support of youth programs, etc. More discussion is included in Section 3.8.

The ongoing land claim negotiation process is expected to address economic development initiatives, ownership of lands, financial compensation, rights regarding natural resources, and related cultural matters. A settlement also has the potential to clearly define the roles of the Algonquin people, provincial and federal governments, and industry with respect to natural resources in the land claim area, including forest management. However, there is no defined timeline or guarantee that the parties will reach an agreement. This particular land claim has been ongoing for over 20 years. OVFI and MNR must not overlook the commitment made in Objective SE-6 of the 2006-11 FMP, or condition 20.1 of the SFL while waiting for a land claim settlement to be reached. Objective SE-6 commits the company to *Identify and implement ways of achieving more equal participation by Algonquin First Nation communities in the benefits provided through Forest Management Planning.* MNR is compelled to work towards the same obligation under Condition 34 of the Declaration Order (2003). Condition 20.1 of the SFL commits OVFI to work cooperatively with MNR and Aboriginal communities to achieve that same goal. The audit team encourages MNR and OVFI to maintain an open dialogue with the Algonquin communities.

3.2.6 Annual Operations Public Inspection and/or Consultation

Based on the results of the IFAPP procedure sampling process, the procedure associated with this criterion was not audited.

3.3 Forest Management Planning

The 2006-11 FMP was the second forest management plan produced by OVFI since acquiring the SFL in 1998. Both the 2001-06 and 2006-11 FMPs followed the requirements of the 1996 FMPM.

The previous IFA of the 2001-06 FMP issued a best practice for the exceptional quality of the plan. The 2006-11 FMP builds upon that success. The plan is well written and offers considerable depth in all subject areas and the underlying analyses. For example, in describing the source of direction for the plan the reader gets a thorough explanation of existing and emerging forest policies at work in Ontario, rather than a listing of guidelines and policy documents.

3.3.1 Plan Author, Planning Team, Chair and Advisor Activities

The planning team was considerably larger in developing the 2006-11 FMP compared to the 2001-06 FMP. Many key positions, such as the plan author, were filled by people who had contributed to the 2001-06 FMP. This experience is a key success factor.

The plan author, who was also a co-chair of the planning team representing OVFI, was a registered professional forester during the planning process for the 2006-11 FMP and the audit period as was the planning team co-chair representing MNR. Their registration was confirmed by the Ontario Professional Foresters Association.

The planning team was composed of a sufficient representation of professionals to address all planning requirements of the 1996 FMPM. OVFI was represented by the general manager, two foresters and a forest technician. MNR was represented by an area supervisor, two foresters, three biologists, an ecologist, a planner, an area technician and a GIS analyst. The LCAC also had a member participate on the planning team as did local Aboriginal communities.

In addition, District MNR had a local support team available to them. Finally, an extensive list of individuals was available to serve as plan advisors from MNR Region, Science, and FMB, as well as other related government ministries.

The Terms of Reference for the planning team was approved by the District Manager and Regional Director prior to the issuance of the first public notice of the formal public consultation process, as required by the FMPM. Plan development and the roles of individuals followed relatively closely the Terms of Reference.

There were minor deviations between planned and actual FMP production, review, and approval dates. The formal public invitation to participate was issued about one month later than was planned in the Terms of Reference. This was a result of minor delays in the submission of the planning inventory and RPFO to MNR for review prior to the invitation to participate. By the fall of 2006, the First Information Centre was pushed back to almost two months later than originally planned. This was due to delays in developing the SFMM inputs and assumptions. The second information centres occurred on March 11-12, 2005, only two weeks behind schedule. The public review of the draft plan also remained about two weeks behind schedule. Public inspection of the final approved plan occurred one month later than originally planned in the Terms of Reference. The audit team acknowledges OVFI and MNR staff in their efforts to adhere to the plan production schedule as much as possible.

3.3.2 Introduction

The Statement of Environmental Values (SEV) briefing note, arising from requirements under the Environmental Bill of Rights, was referenced in the introduction to the 2006-11 FMP. This met the requirements of the FMPM.

3.3.3 Management Unit Description

The plan provided a comprehensive description of the Forest and the associated environment, drawing upon many published sources and local experience. The material is valuable in providing the context for forest management objectives and strategies. The information also provided details that helped to facilitate completion of the IFA. The quality of the information and its presentation, like all of the documents produced by OVFI, met a very high standard that usually exceeds the FMPM requirements.

Most of the forest information was derived from the Forest Resources Inventory (FRI). The inventory used in the development of the 2006-11 plan was based upon 1987 aerial photography interpreted by MNR FRI Branch. The inventory was updated with Free to Grow Survey (FTG) data, supplemental aerial photography and satellite imagery for disturbances from harvesting. The updating procedures used by OVFI met Forest Information Manual (FIM) requirements and several changes to FIM were suggested to track the complex stand structures of the Forest in a more useful fashion.

Many changes in the forest from natural succession and natural disturbances can go undetected in the normal updating procedures. For this reason a new FRI is generated every 20 years and MNR has recently announced a ten year renewal cycle. Theoretically, aerial photography for the Ottawa Valley Forest should have been flown in the summer of 2007. Although a significant area was flown in 2008, the southern portion is expected to be flown next year.

MNR has launched an Enhanced FRI program that features new digital image sources of superior quality compared to traditional black and white prints, faster turn around times, and shorter re-inventory cycles (ten years versus 20 years). This is a commendable move and time will determine how effective this new program will be.

There is concern by both MNR and OVFI that the enhanced FRI schedule may not provide a suitable inventory in line with the forest management planning cycle. The enhanced FRI is scheduled for image acquisition on the Ottawa Valley Forest in 2009 and the final product expected in 2013 will not be available for the 2011-21 FMP. If the cycles of inventory (ten years) and planning (ten years as of 2013) are not synchronized properly, the advances in the enhanced FRI cycle will be of less benefit to the planning process in the Ottawa Valley Forest. In addition, the digital imagery may require computer software and hardware upgrades and printing costs borne by OVFI so that the data is useful for operational planning.

Recommendation 2: Corporate MNR must review the FRI and FMP cycles to ensure they are properly synchronized to meet the planning needs of OVFI and Pembroke District MNR.

3.3.4 Strategic Management Direction

Objectives were included in the 2006-11 FMP to address forest diversity, social and economic matters, provision of forest cover and silviculture as required by the CFSA and FMPM. The objectives adhere to principles expressed in provincial as well as local direction issued by MNR. Strategies relevant to the management unit were included to support objective achievement.

A natural benchmark scenario was developed for the Ottawa Valley Forest to predict how the Forest would develop through time in the absence of human intervention (i.e. no fire suppression, no harvesting or renewal activities). Regional fire records were analyzed and an average fire cycle of 71 – 1,000 years (varied by forest unit) was extrapolated for the pre-suppression scenario for the Ottawa Valley Forest.

This natural benchmark scenario, also called a Null Run, was used to define the acceptable bounds or ranges for certain objective targets, for example acceptable variation in productive forest area by age class groupings was ±50% of long-term natural benchmark projected area for age class groupings; the minimum wildlife habitat acceptable in the management strategy was 20% below the minimum 100-year level for wildlife habitat projected by the natural benchmark.

A range of management alternatives was considered in the 2006-11 FMP, including the three mandatory management alternatives required by the 1996 FMPM to determine the Ottawa Valley Forest's theoretical timber production potential. One additional alternative, later selected for implementation (SMA_FINAL), was investigated by the planning team that provided a more balanced consideration for all objectives, now and into the future.

The range of management alternatives identified in the plan addressed FMPM requirements and satisfied the planning team and LCAC. Both groups supported the continuation of the general management strategy from the previous 2001-06 FMP which was incorporated into the selected management alternative.

The above management alternatives were compared to the Natural Benchmark Scenario to assess forest sustainability and determine estimated bounds of natural variation. A reasonable and comprehensive set of objectives was determined for the FMP, varied for each management alternative and logically incorporated into the Strategic Forest Management Model (SFMM) modeling for those objectives that could be modeled non-spatially in SFMM.

The SFMM inputs included limits or constraints equal to the acceptable bounds or ranges for certain objectives for forest composition, age class distribution and supply of wildlife habitat. These limits were

reasonable and served to constrain the forest area and wildlife habitat projections for the selected management alternative (including fire suppression, harvest and renewal activities) to levels that approximated the natural benchmark scenario through time (no fire suppression, no harvest and renewal).

The FMP management alternatives were analyzed through the use of SFMM, with results documented in the plan for all alternatives. Electronic SFMM files were provided to the audit team for inspection and verification. The FMP provided very good background documentation for most SFMM modelling inputs including development information included in the FMP main text and Analysis Documentation (FMP Appendix 3). The Analysis Package and text documentation for the 2006-11 FMP was comprehensive and will provide an excellent basis on which to build during the development of the 2011-21 FMP Management Strategy.

The SFMM modeling for the 2006-11 FMP was well structured and covered sixteen Year-10 terms (full 150 year long planning horizon from plan start date of 2006). The strategic SFMM modeling incorporated reasonable inputs for forest dynamics (i.e. Natural old age succession, natural disturbances, forest growth and yield, wildlife habitat and unplanned losses), operational harvest and renewal practices, revenues and expenditures and representation of management objective desired levels. The SFMM modeling was constructed to assess projected forest structure and desired benefits resulting from operations consistent with even-aged clearcut and shelterwood silvicultural systems, and the uneven-aged selection system. The Analysis Package and associated discussion in the plan text documented the sources of information used to update SFMM model inputs from the 2001-06 FMP to the 2006-11 FMP, assessed in this audit. The revision of modeling inputs was based on the best information available during the period of plan development. Sources of information for revised modeling inputs included actual field data from the management unit, regional Science and Information data, provincial guides and data and local experience.

The audit team observed that the SFMM inputs regulating annual available harvest area were used extensively. For example, annual harvest area by forest unit was constrained to a maximum change of 20% between Year-10 terms for each forest unit, and the total available harvest area was limited to no more than a 9% change between terms. While these levels of constraints are usually not recommended as it can artificially limit harvest areas and thereby lose potential harvest volumes, this was not the case on the Ottawa Valley Forest. These harvest area constraints did not cause significant losses in volume (no significant losses of volume through natural old-age forest succession were projected). Also the reasons for use of these constraints on harvest areas was clearly rationalized by the planning team and related specifically to addressing the desired benefit of a stable wood supply, as identified by the planning team, LCAC and local shareholders.

Indicators of forest sustainability were described in the FMP and were related to the targets, generally based on average projected natural benchmark run forest condition results where relevant. Projected results were discussed for all management alternatives for all forest diversity and objective achievement parameters with respect to actual data and projected trends. All three mandatory alternatives failed the tests of sustainability in a similar manner due to excessive land base (ecosite) fluctuations through time and variable/low percent available harvest area utilized. Sustainability achievement was superior for the selected management alternative and it was further assessed for objective achievement.

Objective assessment information was presented in the FMP for all alternatives, however since the mandatory alternatives failed to demonstrate forest sustainability, they were not required to be assessed for objective achievement.

The majority of objectives assessed in the FMP were quantifiable. Quantifiable analysis was not possible for objectives related to protection of values during plan implementation. Most of the non-quantifiable objectives were related to operational planning and implementation of the selected management alternative.

For the 2011-21 FMP, the audit team offers the suggestion that non-quantifiable objectives related specifically to operational practices or guide implementation be discussed as operational strategies and not be labelled as separate objectives. The FMPM (2004) that will be used for development of the 2011-21 FMP requires the assessment of several indicators of compliance with operational prescriptions for the protection of various forest-related values. As such, the inclusion of additional management objectives and indicators, above those provincially required, should be reviewed by the planning team and minimized if not required to address specific desired forest and benefits.

The social and economic impact of implementing projected operations in the management alternatives was analyzed in the 2006-11 FMP. The analysis was completed with the aid of a provincially approved model, the Socio-Economic Impact Model (SEIM). Projected harvest and renewal areas, harvest volumes and affected communities were some of the inputs included for each management alternative.

Socio-economic ranking directly related to timber harvested and area harvested and renewed in the first term of the strategic planning timeframe. Therefore the SEIM model confirmed that Alternative MA2 (timber production potential with unlimited silvicultural funding) ranked highest socio-economically as it also projected the highest annual harvest volumes for the 2006-11 period. The FMP confirmed that the objective of creating a more predictable wood supply in the selected management alterative was a priority for the planning team and LCAC. This objective served to moderate harvest volume changes between terms for the SMA, thereby reducing the harvest volume and socio-economic impact/benefits calculated for the first term, 2006-11. This trade-off was considered desirable by the planning team and LCAC when long-term socio-economic and objective achievement assessment was considered.

A spatial analysis is the final component of the determination of forest sustainability. As a component of this audit, the analysis of forest disturbances for the actual 2001-06 term and the projected 2006-11 plan term were reviewed. Frequency of disturbances by size class distribution were compared for 2001, 2006 planned, 2006 actual and the natural template distribution as calculated by MNR for the Ottawa Valley Forest. Information was reported and discussed as required with the caveat that planned clearcuts were assessed rather than gross disturbances due to a limitation of the ODAM model (Ontario Disturbance Agglomeration Model). No negative implications to the analysis were identified and the smaller size of disturbances/planned clearcuts supports the similarity of results between the two scales of landscape pattern analysis.

In order to confirm that the Annual Report disturbance review was reasonable, additional review of the most recent available landscape pattern disturbance data was done from the 2006-11 FMP. Data in the 2006-11 FMP was calculated using the Natural Disturbance Emulation Pattern Guide (NDPEG) Tool, an MNR developed program for analyzing natural disturbance pattern attributes for forest disturbances, planned clearcuts and residual patches. 2006-11 FMP documentation confirmed that 2006-11 planned operations to 2011 will lead the frequency of disturbances by size class to be overall closer to the template distribution calculated for the Ottawa Valley Forest. The analysis was reasonable and good progress toward the template frequency by size class of disturbances was demonstrated for the majority of disturbance size classes, with only minor negative variance or no change reported in three of eight size classes.

Overall the selected management alternative demonstrated forest sustainability, and ranked highest when all objective targets were assessed through the short-term and long-term, and after consideration of socio-economic analysis and spatial analysis, the SMA was selected for implementation. The LCAC was involved in the scoring and evaluation of management alternatives and agreed with the plan as prepared for the Ottawa Valley Forest.

The SFMM modeling, analysis and documentation supported sustainable forest management for the selected management alternative. The analysis of management alternatives was very accurately documented in FMP text, tables and appendices with only very minor variances found that resulted from

rounding of numbers. The documented available harvest area by forest unit was consistent with the outputs from the SFMM modeling and was accurately documented in the FMP text and tables.

Eligibility criteria for harvest, renewal, and tending were stated in the FMP and were consistent with lower operability ages included in the strategic modeling.

Best Practice: The Analysis Documentation of modeling inputs and rationale for specific inputs was excellent in its completeness, discussion of analysis and decisions, and general readability of a technical component of the forest management plan.

The decline in AHA is a high priority aspect for this audit. The 2006-11 FMP identified a 13% decline in the AHA over the previous plan term. The forecasts suggest the current AHA can be sustained over the long run.

A decline in AHA can be a signal that forest health has declined from a combination of natural disturbances or forest management actions (or inactions) of the past. This is not entirely the case on the Ottawa Valley Forest, although some past selection and shelterwood harvests were conducted in the past using inferior standards than applied today. There are several other important reasons why the current AHA is much lower than planned levels from earlier plans. Some area was withdrawn from the productive forest land base for conservation purposes and the methods used to calculate the AHA have changed. Much of the forecasted decline is to further ensure the ecological viability element of sustainable forest management by applying new guidelines (e.g. NDPEG and old growth). In addition, constraints were applied in SFMM as described above to ensure future AHA levels remained relatively stable. For similar reasons, many if not the majority of other forest management units in Ontario show a pattern of declining AHA compared to forecasts made in earlier plans.

Equally valid to concerns of ecologically viable future forest conditions are the concerns about the social acceptability and economic feasibility components of sustainable forest management. The FMP process in Ontario is well designed to ensure socially acceptable practices within the context of sustainable forest management. Jobs and revenue are tightly connected to AHA. The economic feasibility of proposed forest operations deserves careful consideration in future plans. As the allowable harvest area begins to match demand, the AHA becomes fully allocated in the operational planning problems can be more pronounced such as age class substitution in certain forest units.

3.3.5 Operational Planning

The 2006-11 FMP met the FMPM requirements for operational planning. The allocation of harvest areas was generally consistent with the areas by forest unit and age class identified as the selected management alternative for implementation. All other operational planning requirements for access, harvest, renewal and maintenance were met.

Forest management planning included protection of a suite of nontimber forest values. The FMP contained a lengthy review of flora and fauna found on the Ottawa Valley Forest and the potential impacts of forest management on the habitat of these species. Many of the species discussed were unlikely to be affected by forestry activities due to the type of habitat they occupy or due to the fact that protection is conferred via non-harvest reserves prescribed to protect other values.

MNR maintains the Natural Resource Values Information System (NRVIS), a digital database of a variety of mapped values that require protection during forestry operations. Common examples of such values on the Ottawa Valley Forest are lakes and streams, raptor nests, moose aquatic feeding areas and deer yards. The 2006-11 FMP contained 21 generic AOC prescriptions that provided a standard approach to protection of common values. Associated prescriptions followed provincial guideline direction. A separate category of AOCs allowed for development of specific prescriptions to protect unique values such as a local ski club's cross country ski trails.

The previous audit team had recommended that Corporate MNR fulfill its obligation to adequately fund the collection of values information; the issue being that Corporate MNR had provided only 58% of the monies requested for values collection during planning and that the District had to draw upon its own resources. In the lead up to the 2001-06 FMP, Corporate MNR allocated $41,000 to Pembroke District for values collection. For the 2006-11 FMP Pembroke District received $62,600 in 2004-05 for values information updating during planning. The money was spent principally on MAFA surveys, stick nest surveys and stream permanency surveys. For the five years of the audit term MNR allocated $106,800 to values data collection. The District also now has a separate allocation of money for the species at risk program that is being spent principally on data collection for ginseng and wood turtle. In addition to the values data collection work conducted by MNR, many nontimber forest values are identified by tree markers and company field staff since they spend much time walking planned harvest blocks. The increase in funding for values collection is positive and has led to improved preoperational data collection overall compared to the previous audit term.

In response to a previous audit recommendation a significant amount of work was conducted by the District Biologist to improve the approach to deer yard management. Criteria were established that reduced the number of core deer yards to four from the previous twenty. Management activities within the core yards focus on maintaining and improving critical thermal cover (Figure 3) and increasing available browse. The District Biologist has since delivered training to tree markers on deer yard management requirements.

The Forest is well roaded and no new primary roads were planned in the 2006-11 FMP. Six existing roads were reclassified as primary with supporting documentation provided in the Supplementary Documentation. Since all were existing roads, no alternative locations were proposed. Upgrades to secondary road status were proposed for three tertiary roads for a total distance of ten kilometres. An extensive program of primary and secondary road maintenance was planned over a total of 428 km, representing almost the entire network of primary and secondary roads on the Forest, based on the Districts roads inventory figures. Table FMP 26 identified access controls for two roads (Wilson Lake, Rock Lake) associated with the Madawaska Highlands Land Use Plan (MHLUP). No primary or secondary roads were identified for abandonment during the term of the FMP, although roads within the Madawaska Highlands are subject to conditions, including abandonment, set out in the MHLUP.

A high priority aspect identified to the auditors was the difficulty in allocating older poplar stands to match the SFMM output (i.e. the strategic direction or selected management alternative). SFMM is a non spatial model in that location is not an input variable. SFMM uses linear programming methods to derive an optimal solution. Although this method is perfectly acceptable for solving a problem such as the best level of silviculture investment, it is less useful in the harvest allocation process. This is a systemic problem that becomes more prevalent as the AHA begins to match harvest demand levels such as the case on the Ottawa Valley Forest. Recommendations were made in earlier audits on other forests by this and other audit teams that MNR consider broadening the scope of its decision support tools to include other types of models that can, among other things, help in the allocation process.

The rate of substitution of age classes on the Forest should not have a long term impact on forest sustainability given that the poplar dominated cover types represent less than 10% of the AHA. Many of the older poplar stands as identified in an already dated forest inventory have succeeded to younger unmarketable mixedwoods and hence there are practical reasons for substituting these stands for younger aged poplar stands. Improvements in forest inventory (see Recommendation 2) and an expanded decision support system should help to further ensure that the rate of substitution does not become an issue of forest sustainability.

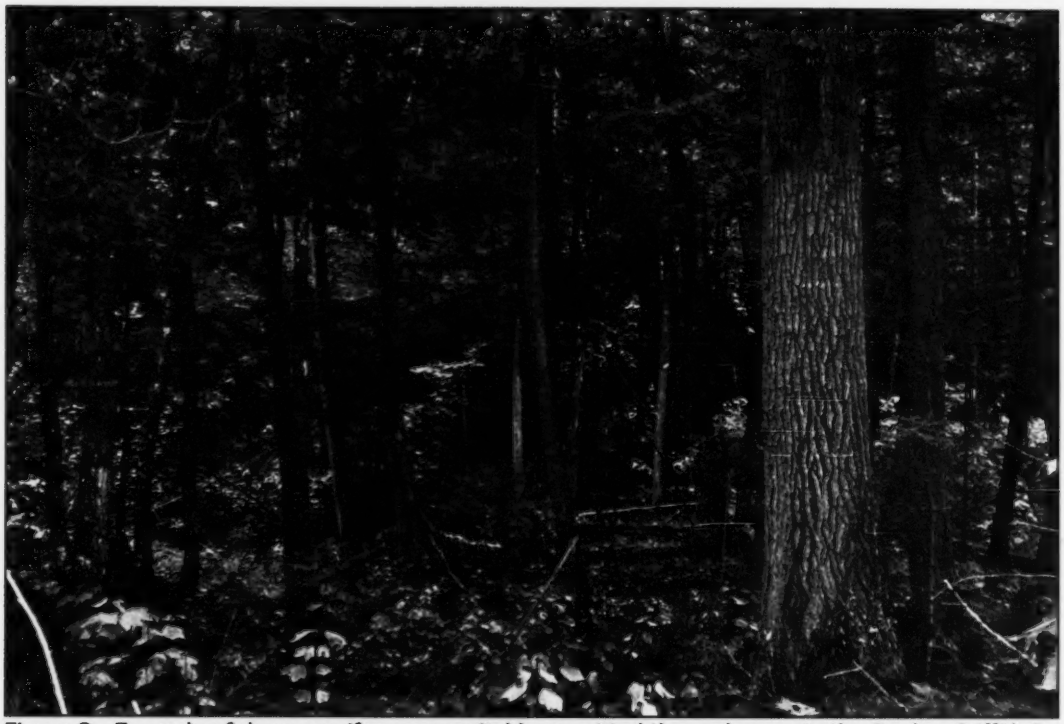

Figure 3. Example of dense conifer cover suitable as critical thermal cover in the Raglan-Griffith Deer Yard.

For SFMM to produce "optimal" allocations the model requires reliable forest inventory, growth and yield information and complete unrestricted forest access. Although these conditions exist in other forests (e.g. plantations in Chile), they do not exist for the most part on the Ottawa Valley Forest. Therefore, the assumption that the SFMM output is optimal is flawed. For this reason, the deviations in the on the ground allocations from the SFMM allocation are not seen by the audit team as a significant issue.

The 2006-11 FMP stated that contingency area would be used to replace area losses in normal operating areas that resulted from the introduction of NDPEG. This is contrary to the FMPM that specifies that these areas are only to be used for unforeseeable losses such as wildfire. The NDPEG losses are foreseeable. Technically, the plan does not follow the FMPM. Nonetheless, both the plan author and the District Manager exercised good professional judgement to use these areas for dealing with a relatively new allocation problem presented by NDPEG, since these areas are identified to the public as potential harvest areas. However, either the planning manual should be updated to allow for the application of broader professional judgment or greater care should be taken in following the manual.

Recommendation 3: Corporate MNR must review the use of contingency areas and NDPEG and either update the FMPM or the NDPEG such that the use of contingency area is more clearly defined and consistent in both documents.

3.3.6 FMP Submission, MNR Plan Review and Approval

The 2006-11 FMP submission, reviews and approval met all FMPM requirements.

An interesting feature of plan review in Ontario is that MNR planning team members are also plan reviewers. MNR seems content with reviewers also being part of the planning process. The IFAPP procedures direct the auditors to: "assess whether any reviewers were also plan advisors or planning

team members and whether this was beneficial for an efficient review (i.e. minimizing the amount of alterations)". The wording of this procedure suggests that these dual roles are desirable.

All of the reviewers were MNR advisors or planning team members. The preliminary list of required alterations of the 2006-11 FMP had 1,005 entries into a database. These numbers are typical of an FMP in Ontario. The list was completed on September 20, 2005 allowing sufficient time for the plan author to respond to the comments. The reviewers completed their tasks with care and diligence under the normative conditions of planning in Ontario.

Senior Management in MNR is concerned about the growing costs of producing management plans in Ontario. The cost is less of an issue perhaps than value for dollar spent. The 1996 FMPM has numerous redundancies where the same data is recast in several different ways. The 2004 FMPM has made some improvements in this regard but redundant material is still a problem. The FMPM is highly prescriptive, forcing attention to minor details. This adds to both plan development and review costs.

MNR has released a new version of the FMPM in December 2008 designed in part to address these issues. The planning manual on its own can only gain so much efficiency. Further gains are possible if the review process were streamlined. For example, a government review of a complex management plan in another jurisdiction had 17 high level recommendations for improvement as required alterations. This is in sharp contrast to the hundreds of required alterations associated with the 2006-11 FMP and typically the majority of management plans in Ontario. Corporate MNR should continue its efforts to streamline its FMPM review procedures.

3.3.7 Contingency Plans

There were no contingency plans during the audit term.

3.3.8 FMP Amendments

There were 16 amendments to the 2006-11 FMP in the first two years of plan implementation. All of these were classed as administrative amendments, several approved salvage of timber from wind and pathogen caused damages. There were also several corrections to the FMP in AOC prescriptions, minor changes to road locations and silviculture ground rules (SGRs). The previous plan had 18 administrative amendments. The amendments fully conformed to FMPM requirements.

3.3.9 Annual Work Schedules

The approved Annual Work Schedules (AWSs) met FMPM requirements and were submitted on time The Forest Operations Prescriptions (FOPs) were prepared in accordance with the FMPM and were consistent with the SGRs of the associated FMP.

The District Manager raised a concern that there are about 40 to 50 revisions to the AWS, suggesting that pre-planning work in the field needs improvement by the contractors and SFL shareholder companies. The SFL manager agreed but felt that MNR's approval process might also be modified to reduce the administrative burden (e.g. private land access and un-mapped stream crossing approvals). This same issue was raised in the previous IFA and the status report showed that although the actions are completed, some problems remain.

There are several causes to the high number of revisions that include the biophysical complexity of the forest and the relatively large number of small operators. These operators do not have the resources, interest or willingness to subcontract the preplanning tasks to achieve a higher level of performance.

Significant changes to the socioeconomic environment to rectify these issues involve some major shifts in both provincial policy and community acceptance (e.g. consolidation of small independents into larger but fewer contractors that can carry out more complex planning and road building tasks). MNR is considering tenure reform proposals at the Provincial level that when enacted may mitigate these problems. With few exceptions, as noted in this report associated with roads (Recommendation 4), the operations are completed to a relatively high standard.

A question that needs to be addressed is whether or not a significant restructuring of the SFL or MNR procedures as a remedy to frequent AWS revisions is worth the cost of eliminating the problem. The lack of pre-planning by some contractors and the associated revisions increases the workload on MNR and diverts resources away from other tasks that may be a higher priority. This issue is a source of frustration for MNR and is connected to the broader issues of relationship building between the SFL shareholders and MNR with respect to compliance monitoring associated with Recommendation 7. Rather than offer additional recommendations, it is apparent that both parties to the SFL have a lot of work to do in addressing the relatively small number of interrelated recommendations offered in this report.

The Draft 2008 FMPM currently under review includes some significant changes to the AWS procedures. The audit team suggests that MNR and the Company continue to work toward improving both pre-planning field work and administrative procedures with the aim of reducing the number of revisions to the AWS within the context of new policies and FMPM guidelines.

3.4 Plan Assessment and Implementation

3.4.1 Plan Assessment

The FMP forest descriptions and modeling assumptions were found to be consistent with the forest conditions observed in the field.

3.4.2 Areas of Concern

Known values were identified on operational maps during initial planning. New values were often discovered (typically stick nests) and reported by tree markers. Values information was updated, following verification by MNR staff, and the appropriate AOC prescription was then applied. MNR also conducted spring stick nest surveys on high potential nesting areas, with a focus on areas suited to red-shouldered hawk. All of the AOCs examined by the audit team were well marked and AOC prescriptions were appropriate for the value and were followed. In addition to marking of AOCs, wildlife trees (typically cavity trees) were also marked to prevent their harvest (Figure 4).

The audit team's examination of AOC marking from the air and on the ground was facilitated with a GPS with a sufficiently high level of accuracy to verify actual to mapped locations of many AOC related features. There were no variances observed by the audit team between mapped AOCs as marked on the ground. These observations combined with the other audit team observations about access and harvest operations speak not only to an effective compliance plan, but to a high level of competency shown by operators, OVFI staff, tree markers, and MNR.

The audit team examined a value identified as an osprey nest associated with Stop 7 (The Pinery). The block was harvested in 2003-04. There was no evidence of an osprey nest; however, six heron nests were present. It is not known whether this was a case of incorrect identification of the value initially or a change in the intervening time since the harvest. In any event, misidentification of values would appear to be rare based on the field audit observations.

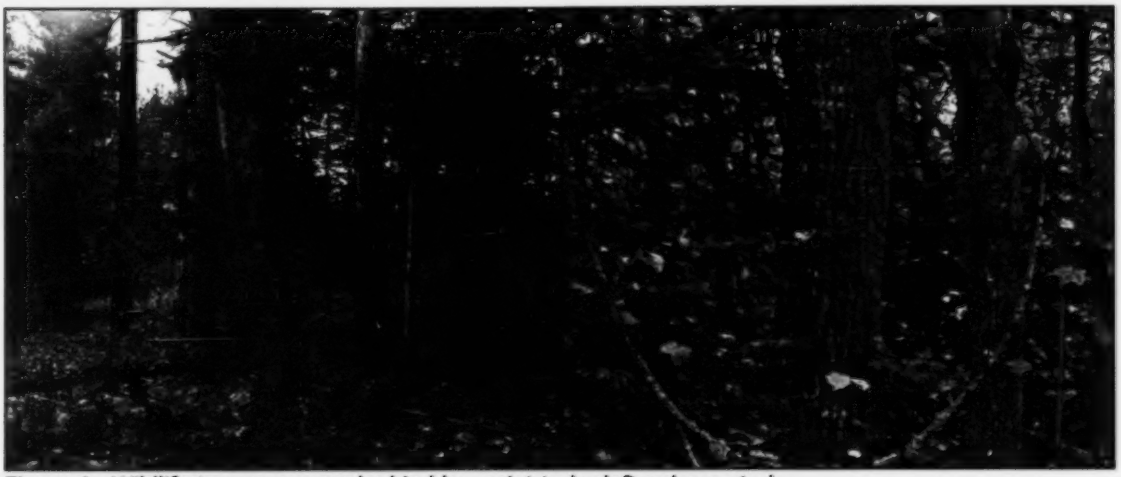

Figure 4. Wildlife trees were marked in blue paint to be left unharvested.

3.4.3 Harvest

The complex and uneven aged structure of these forests strongly link together harvest and renewal aspects of forest management. Many stands present a challenging mix of species, tree sizes, qualities, and product potentials. In all instances the prescription leads to an improved forest condition given time for the smaller trees to develop. OFVI recently extended the cutting cycle to further allow for improved future forest conditions. Although there is little empirical evidence to support this change and the current prescriptions and cutting cycles rely upon professional judgement, it demonstrates a commitment by MNR and the Company to enhance the forest resource.

Based upon the field audit observations a question arose: does the concern over the future forest condition lead to conservative prescriptions at the expense of today's harvest operators? When asked the question, a Company representative remarked that one of the shareholders said, "I don't mind paying for the sins of my father (referring to past high grading practices) but I would rather not pay for it all at once". This concern gives further merit to the need to improve inventory methods and effects and effectiveness monitoring as described in Section 3.6.3.

In the complex stand types, trees are marked by certified tree markers and follow the prescriptions developed by the planning forester and other foresters at OVFI after careful site inspection. Frequently, the tree markers encounter unmarked values such as stick nests and they implement prescriptions to protect those values.

The tree marking prescriptions were consistent with the plan and were appropriate to the site conditions. The harvest followed the tree marking prescriptions with very little variances.

There were no observed instances of site damage. There were isolated incidents of wasteful practices (Figure 5) and damage to residual trees In these cases corrective action was taken quickly demonstrating effectiveness of the compliance plan and its implementation. In fact, the utilization and care in harvest operations were exemplary given the site and stand conditions encountered during the audit.

A severe wind storm during the summer of 2006 led to significant changes to the proposed harvest schedule and silvicultural plans. The salvage operations were quickly implemented and completed to a high standard recovering a considerable amount of damaged timber. Many hectares of carefully managed stand improvement areas and shelterwood forests were converted to clearcut even-aged forest types.

The majority (123,199 m^3) was red and white pine. The drought/*Armillaria* (root pathogen) salvage in the south also contributed to this volume because it specifically focused on dying red pine. There were also small amounts of wind damaged salvage in the previous year.

Field inspection of the salvage areas showed that harvest operations had excellent utilization, even in the poor market conditions. The operations and reporting of the salvage were consistent with the terms of the SFL and under the circumstances showed a high level of commitment to meeting both the terms of the SFL and the principles of sustainable forest management.

Figure 5. Isolated occurrences of wasteful practises were quickly corrected during operations in accordance with the compliance plan.

3.4.4 Renewal, Tending and Protection

Renewal activity on the Ottawa Valley Forest was implemented in accordance with the FMPs with some variance in response to the windstorm salvage and the rate of harvest that mirrored market conditions. The effectiveness of the tree marking system and associated stand improvement and forest renewal was described above. This section focuses upon natural and artificial or assisted regeneration under various silvicultural systems.

The regeneration of white pine from natural seeding supplemented by site preparation and planting was identified as a high priority aspect in the audit plan. The audit team carefully considered MNR's concerns that tree planting, tending, and site preparation practices were below acceptable standards during much of the audit term.

Sites were prepared for planting and natural seeding by the use of slash rakes and blades either mounted to the front or the back of skidders and light bull dozers. In one configuration a blade is mounted on the back of a skidder's grapple attachment. This is a novel arrangement that increases site preparation productivity (hence reducing costs) and ensures that the duff and slash can be realigned without damaging roots of the shelterwood trees. This tool was also used in clear cut areas. It appears to be effective for aligning slash and knocking down brush, but does not produce a consistent pattern of plantable spots or spots with microsite qualities that enhance the establishment and growth of conifers. However, sufficient numbers of plantable spots were being found by planters to meet establishment goals.

MNR issued compliance reports for site preparation and tree planting quality. The compliance program is not designed for these purposes and these reports are contrary to MNR's internal direction for compliance

reporting. Senior MNR staff provided direction to the District and corrective actions were implemented in compliance reporting. However, these compliance reports reveal a high level of dissatisfaction with the contractor's performance in conducting the forest renewal program that persists throughout the audit term. MNR also discussed their dissatisfaction regarding the contractor and the forest renewal program with the audit team during interviews.

The Company maintains that the artificial renewal practices and the contractor's performance are deliberately less intensive than practised in the past and on similar sites with similar objectives on other forests. The practices are designed to reduce the cost to shareholders while still meeting plan objectives.

The audit team's field observations found that the planted conifer trees showed good survival and growth on most sites. The ground tending with herbicides was also effective in releasing the conifer trees on the sites sampled by the audit team. Some instances of missed patches within tended blocks were observed. These had been noted by both MNR and OVFI staff, but were seen somewhat differently by the two. MNR staff were concerned that silviculture dollars were being wasted, and silviculture success was jeopardized. OVFI staff viewed the situation as a normal part of working with silviculture contractors. OVFI staff felt that although the work was not perfect, their contractors were normally achieving acceptable results and where not, they were being returned to the area to improve the work quality. Further, OVFI staff noted that continued monitoring is required, and they expect a high level of success.

There were several sites within deer yards where herbicides are not used and regenerating conifers are released from hardwood competition using brush saws. At several locations, manual tending with brush saws appeared inadequate to release the white pine trees. Although young white pine trees tend to benefit from some competition, some of the sites appeared to have excessive competition from hardwood regeneration.

There were no protection projects undertaken during the audit term. However an amendment to the plan was made to allow salvage harvest of red pine showing stress from root pathogens (*Armilleria* spp).

The majority of sites rely upon natural regeneration and these sites are not an issue. The white pine shelterwood and clearcuts planted to conifer are areas that concern MNR staff. The audit team notes that the number of plantable spots created by site preparation is relatively low on some sites and that the tending practices may not be sufficient to release conifers on portions of several other sites. OVFI acknowledged the need to further improve the forest renewal contractors' performance and is committed to doing so.

The forest renewal activities on the whole appear to be effective during the audit period at regenerating the Forest and meeting plan objectives. The issue of silvicultural effectiveness is examined in greater detail in Section 3.6.3 of this report. MNR's dissatisfaction with the renewal contractor and OVFI's renewal program is part of a larger compliance and relationship issue that is described more thoroughly under the compliance monitoring section (3.6.1 and 3.6.2) of this report.

3.4.5 Renewal Support

The renewal support program maintained on the Ottawa Valley Forest is adequate to meet the needs of the renewal program. The audit team visited the Gratton Seed Orchard and viewed an area where progeny tests are being conducted by MNR Science and Technology Unit. Most of the seedlings planted on the Forest are grown in Kemptville, and were available as needed. Seeds are collected when available and required amounts are stored at the Ontario Tree Seed Plant in Angus, Ontario.

3.4.6 Access

Access to the Forest consists of numerous municipal roads, highways, and forest access roads. The access program viewed in the field was consistent with the approved plans. There was no primary road

construction during the audit term; a small amount of upgrading of operational roads to branch road specifications was done. Some decommissioning work (water crossing removals and berm construction) was also reported and viewed during the audit.

There are numerous access controls that include gates to ensure that the intent of the Madawaska Highlands Land Use Plan (MHLUP) to limit access to the agreed to levels is maintained. There were some compliance issues related to the positioning and the standards used in constructing some of these gates. The Company also raised issues about MNR's level of enforcement and its reliance on the gates (paid for and maintained by the Company) to achieve access control objectives. This issue is part of larger compliance and relationship issue examined in greater detail in Section 3.6.1.

The forest access roads are generally well constructed although the audit team noted that improvements could be made in the placement and size of cross drainage culverts. The cross drainage installations are smaller than required in some cases (Figure 6) and infrequent in others. Minor improvements in ditching, road crowning, and cross drainage to reduce runoff velocity on steep hills will reduce instances of erosion and road bed deterioration (Figure 7).

Recommendation 4: OVFI must consider additional attention to road construction standards and techniques to reduce runoff and improve cross drainage as part of its compliance program.

Figure 6. A four inch pipe is inadequate to allow proper drainage.

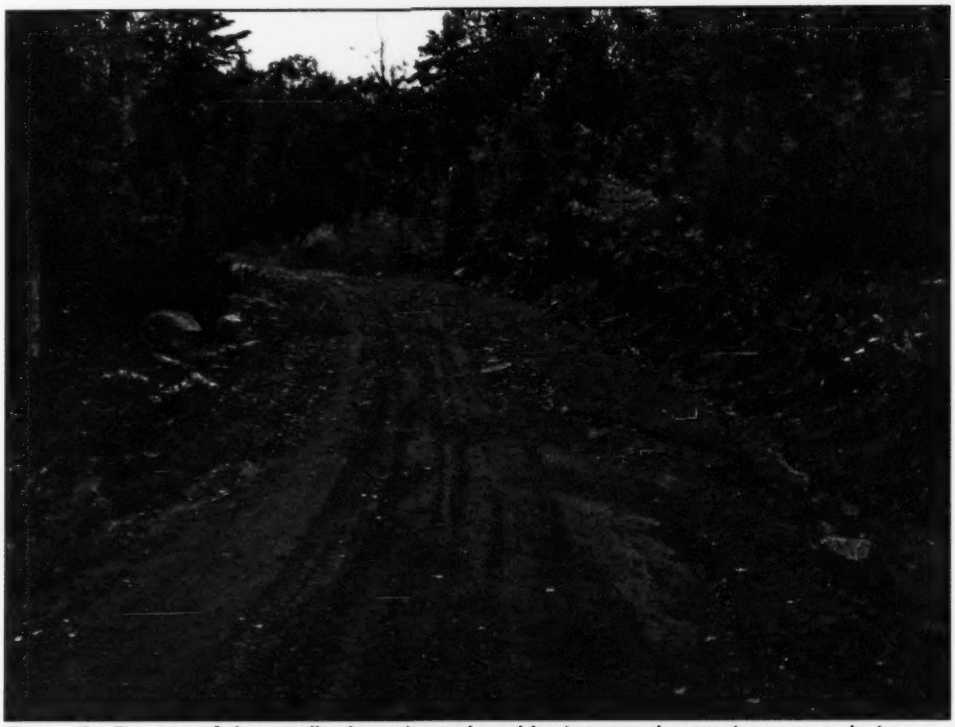

Figure 7. Erosion of the roadbed can be reduced by improved crowning, cross drainage, and ditching.

The roads constructed in the audit term had a minimal number of stream crossings. One temporary bridge was installed over an older bridge to maintain safe access. Both are planned to be removed in 2009 and the portable bridge reinstalled (Figure 8).

There are many instances of older crossings that were poorly installed, have deteriorated, or fail to meet modern standards (Figure 9). In December, 2000 a joint MNR-forest industry task team was assembled to sort out this ongoing Province-wide problem. The Forest Roads and Water Crossings Initiative Task Team Report (2003) provided proposed solutions that will be addressed in the 2011-21 FMP.

Several decommissioned crossings that were removed were examined and found that measures to control sedimentation had been taken by the Company. Modifications to the decommissioned crossings by other forest users have reduced, in some instances, the effectiveness of the treatments (Figure 10). The damage appears to be limited in the cases observed by the audit team. This is a fairly widespread problem in Ontario but there appears to be little political will to impose further restrictions on recreational users of the forest beyond those in land use plans (e.g. MHLUP) and access restrictions to certain water bodies.

Where land use objectives are not compromised there is little concern about access made through the alteration of an abandoned crossing to make fords or make-shift bridges by recreational users of the forest. It is somewhat ironic that so much care is taken to avoid effects on water quality and fish habitat during both construction and decommissioning phases but unauthorized alterations by the general public are not viewed in the same way.

Several Category 14 and one Category 9 pit were examined by the audit team. Although most aspects of the sites examined conformed to the requirements of the provincial *Aggregate Resources Act*, one Category 9 pit had some slopes that exceeded the angle of repose and there were no access controls. The scale of operations is such that there is little risk of injury to people operating the pit and those who access the pit without authorization using ATVs.

Figure 8. Temporary steel bridge over older wooden bridge allowed safe access and reduced stream sediments from old bridge until proper repair is made (Doorley Creek Rd.).

Figure 9. Perched water crossing installed prior to the audit period.

Figure 10. Decommissioned water crossing showing evidence of alteration to permit vehicle access.

MNR and the forest industry have entered into an agreement to share the costs of main road construction and maintenance. Under the agreement individual SFL holders are reimbursed for eligible construction and maintenance work on primary and secondary access roads. A sample of road work funded under the agreement was reviewed. The audit team examined OVFI invoice summary records for 2007-08 for work reported under the agreement. OVFI invoiced MNR a total of over $900,000 for work such as culvert maintenance, grading, brushing, and snow ploughing. Examination in the field by the audit team confirmed that certain work, such as grading, occurred as reported. Records of inspections of stream crossings were also checked. Snow ploughing and winter sanding, which accounted for the majority of work conducted between November and March, could not be field verified.

3.5 System Support

3.5.1 Human Resources

The qualifications and training of staff at both MNR and OVFI is appropriate to the management responsibilities of each organization. MNR staff positions with direct responsibilities on the Ottawa Valley Forest are:

- District Manager
- Areas Supervisors (2)
- Area Foresters (R.P.F.s) (2)
- Area Biologists (2)
- Forest Technical Specialist (1)
- Area Technicians (5) (7 at start of audit period)
- Resource Management Clerk

Most staff positions have duties that are broader than forest management. Further support to forest management is provided by other District and Regional staff.

MNR staff received regular training throughout the audit term. Examples of training provided by MNR to various staff include:

- Forest Compliance
- Tree Marking
- Forest Management Planning
- Code of Professionalism
- Water Crossings
- Moose Aerial Inventory
- Turtle Ecology

Each staff person has a performance development plan that documents individuals' training requirements. An annual review is conducted that includes an assessment of training received or not received during the year. The District maintains a database that tracks mandatory training, although it appeared, based on internal MNR correspondence, that the database was incomplete for one employee sampled at the time of audit.

OVFI has a staff of six holding the following positions:

- General Manager
- Planning Forester (R.P.F.)
- Operations Forester (R.P.F.)
- Senior Compliance Technician
- GIS Data Technician
- Administrative Assistant

OVFI staff conducted SFL administrative tasks and some field tasks such as boundary marking and compliance monitoring. Field operations (access, harvest, tree marking, silviculture, compliance monitoring) were conducted by the shareholders' workforce and contractors. A variety of training courses was attended by various OVFI, shareholder and contractor staff during the audit term including forest compliance, S102 fire fighting, Free-to-Grow, and tree marking. Operational workshops for staff and operators were held covering such diverse topics as forest compliance, logging damage, field layout practices, values updating, and species at risk.

The entire SFL delivered program from planning, compliance and renewal monitoring is funded from revenue generated from timber harvests paid for by the shareholders and overlapping licensees. Under current market conditions, this model is becoming harder to maintain. MNR staff expressed concern that the SFL staff was being stretched too far. Although the audit team is not concerned about the situation within the audit period, it shares this concern about the future. The SFL approach that has worked well over the last decade is becoming at risk.

Given the mix of public and private goods and services from the forest (e.g. wildlife habitat and timber), it would seem fair to consider whether some public monies should be spent supporting the SFL either through cash or in-kind services. In-kind service is being provided to some extent already by MNR. Examples included the MNR science programs that the Company uses on a regular basis and a roads funding program that is in place. But are sufficient levels of in-kind service and cash being invested? This question is related to how MNR proceeds in defining its mix of partnership and enforcement roles at the local level but is directed at the most senior levels of MNR's management for their consideration.

Recommendation 5: Corporate MNR must review the funding formula for SFL administration at the provincial level to ensure the correct balance of private and public funding as well as in-kind support is being provided to SFL holders to properly administer the forest management program on behalf of the Crown.

3.5.2 Documentation and Record Quality Control

MNR maintains the Natural Resources Values Information System (NRVIS) and the Forest Operations Information Program (FOIP). It also maintains the Forest Information Portal (FI Portal), an internet site used to transfer forest management planning information between companies and MNR. It was introduced for use in 2002 with improvements made since that time. The FI Portal is now well established and commonly used with further development and improvement expected to continue over the next few years. The system maintains dates of when information was posted by the company and downloaded by MNR and is the electronic repository of "official documents". The audit team was provided limited access to the FI Portal in order to obtain copies of approved documents for review during the audit process and commends MNR for providing this access.

The results of compliance inspections are made available to the public in Annual Reports through MNR's website (www.mnr.gov.on.ca/en/Business/Forests/2ColumnSubPage/STEL02_167073.html) in Tables AR-12 and AR-13. This transparency and public accessibility is commendable. Tables viewed on the website were compared to Annual Report tables received as part of the audit package and downloaded from the MNR forest information portal. The data in AR Tables 12 and 13 for the 2005-06 year do not match between the two sources, suggesting that there is a document control issue.

Recommendation 6: Corporate MNR must review its document control process for its website postings.

OVFI maintains most of their documentation and archives in an electronic format. Responsibility for documentation control rests with the individual based on their job responsibilities. For example, the plan author is responsible for maintaining the planning documents and a library of electronic reference material, the individual responsible for the GIS maintains all spatial data, and the General Manager is responsible for management-specific and financial documents. Employees work on a peer-to-peer network to allow for file sharing. Core areas of each employee's computer are backed up regularly and taken off-site. OVFI staff currently submits information to MNR through the FI Portal as per FIM specifications. OVFI staff provided the audit team with requested records and information in a timely manner. The audit team determined that OVFI has an effective record management system.

3.6 Monitoring

3.6.1 District Compliance Planning and Associated Monitoring

There were considerable improvements in data handling and reporting under FOIP within the audit term. Compliance inspectors are now certified after rigorous training and the number of certified inspectors has increased significantly during the audit term across the Province. The program at both the provincial and regional level is progressive and responsive.

MNR Pembroke District produced annual compliance operations plans since 2006. The plans feature a comprehensive risk ranking system to ensure sampling effort is assigned the right level of priority. District staff received regular training and is certified. Staff undertakes their tasks and maintains records consistent with the compliance handbook and other regulatory directives.

The number of planned inspections in 2006-07 (108) shows reasonable agreement with the actual level of inspections as reported in the ARs (88) when prorated against the actual harvest level. MNR verifies industry reported non-compliance and conducts its own site inspections.

The District Compliance planning and implementation has been a source of controversy during this and the previous audit terms. The Company believes that the level of oversight and fines are disproportional compared to other forest management units and out of line with the performance of the contractors in a complex forest environment. MNR is confident that they are administering compliance in the appropriate

way. The previous audit identified this as a problem and made several recommendations to address this issue.

In response to the above controversy identified in the previous audit, MNR and OVFI worked on a terms of reference to study the problem in 2005. The terms of reference exercise was abandoned by the Company and it commissioned its own review by an independent consultant. This action by the Company "dismayed" the District Manager who then directed his staff to not participate in the Company-led review. The independent report was dismissed by MNR as being biased. The actions taken by both the Company and MNR illustrate the magnitude of this controversy.

The compliance records were reviewed carefully by the audit team. The reports leave the impression that the Forest is not being managed well. This impression is in striking contrast to the audit team's field observations. This controversy over MNR's implementation of its compliance program has become counterproductive to the execution of the forest management program on the Ottawa Valley Forest. The positions taken by MNR District staff are likely entrenched. For this reason, MNR's senior management from either the Region, Management Branch, or both must take steps to resolve this situation in a timely manner.

Recommendation 7: MNR Region and/or Corporate MNR must take steps to resolve the long standing controversy over the implementation of the compliance program in the Pembroke District.

3.6.2 SFL Holder Compliance Planning and Monitoring

The SFL holder had a compliance plan in the FMP that was updated each year within the AWS. These plans were well written and comprehensive. The compliance program is consistent with the plan. The program is effective in terms of corrective action seen in the field and there is a generally high level of compliance across all of the SFL shareholder's operations.

The Five-Year Forest Compliance Plan (2006-11) describes the compliance environment as follows:

> *Challenges facing the company during the previous compliance plan still exist today - relatively small allocations; high pulp to sawlog ratios due to past practices; low harvest yields from partial cutting systems; complex stand dynamics and silviculture systems; numerous and diverse natural resource values to protect; demands for multiple use, and; access across private land.*

The audit field inspections revealed that OVFI, its shareholders, and overlapping licensees have met the above challenges in an exemplary fashion. The work is exceptionally good from layout, mapping, operations, and monitoring through to reporting within a highly complex operating environment. Credit for this high level of achievement is due to the SFL holder, contractors and MNR. The tree marking, compliance training and certification programs sponsored by MNR are producing good results. The skill and diligence of the operators, inspectors and foresters are also evident in the field.

The self compliance model adopted by Ontario over the last ten years is effective in building a high level of awareness among operators and has produced good results. The fears raised by some observers that "the fox should not guard the hen house" appear unwarranted.[2] Our audit experience over the last 12 years since the IFA program was initiated included many forests in transition from Crown direct delivery to SFL delivery of the forest management program. In all instances, the SFL delivery model showed greater accountability and efficiency compared to MNR direct delivery. OVFI's performance is consistent with our observations on other forest management units and currently is delivering its compliance program to a high standard.

[2] Pembina Institute; 2003, Industry self-inspection and compliance in the Ontario Forest Sector.

The OVFI senior compliance technician co-ordinates the compliance program on the Ottawa Valley Forest with the assistance of trained and certified compliance inspectors that are either employed by the Overlapping Forest Resource Licensees (OFRLs) or are hired as contractors. The arrangement the OFRLs choose is based in part on the scale of their operations, but also on the degree to which the company is directly involved in forest operations. Hec Clouthier and Sons Inc., John Stewart Forest Products Ltd., Ben Hokum and Son Ltd., Bonnechere-Madawska Sustainable Forestry Alliance (BMSFA), Herb Shaw and Sons Ltd. and Commonwealth Plywood have all developed compliance monitoring capacity within their organizations. Murray Bros Logging Co., Gulick Forest Products Ltd., Thomas J. Neuman Ltd. utilize contractors to provide compliance monitoring services. Herb Shaw and Sons Ltd. has developed a cooperative relationship with Makwa Community Development Corporation (MCDC) on many fronts, including providing compliance monitoring services on behalf of MCDC.

The Ottawa Valley Compliance Committee was created in 2000 to provide a forum for compliance inspectors to discuss compliance issues and to provide input leading to continuous improvement of forest operations and efficiency of the compliance program. The committee is comprised of representatives of OVFI shareholders and meets quarterly for indoor and/or field sessions to focus on recurring problems, developing trends and new forest operations challenges. This committee has promoted a consistent approach to compliance throughout the District.

OVFI maintains an ongoing program of training to ensure that compliance inspectors remain abreast of evolving direction and operational issues. OVFI also conducts an annual spring operators workshop that extends training to all forest operators including silvicultural contractors that may be employed on the unit. OVFI reports on training in the Annual Reports.

3.6.3 Silviculture Standards and Assessment Program

MNR Pembroke District followed the direction from MNR Region to report on silvicultural (forest renewal) effectiveness as part of a Province-wide effort. Several field audits were conducted and compared against data collected by the SFL holder. Numerous discrepancies were found. The language within the ARs and the silvicultural effectiveness monitoring (SEM) reports developed by MNR gives further weight to the audit teams concern about the issues of trust and partnership discovered in the review of the compliance program.

Some of the technical issues surrounding survey methodology that was different between the two organizations have gradually been resolved. A new system was developed through a combined effort of OVFI, MNR District, MNR Region and MNR Science staff. There is general satisfaction with the new methodology but it is in the early stage of implementation. There is a strong sense of ownership and the process developed is providing an adaptive management feed back response that OVFI has already used to adjust practices (e.g. moving white pine renewal up the slope to avoid blister rust in some portions of the Forest).

Although the recently designed FTG survey system is providing satisfactory information to OVFI and MNR, the plot numbers remain insufficient to derive statistically reliable levels of repeatability and precision at the stand or block level. For this reason the system requires MNR audits to sample the same plot locations to ensure plot level precision. At the closing meeting the audit team suggested that vertical point sampling could be used to determine crown closure by species and height classes with sufficiently large samples for stand level precision at similar costs to the current method.

The work undertaken by OVFI and MNR to develop mutually acceptable FTG survey standards that differ from those described in the Silvicultural Effectiveness Monitoring Manual for Ontario (SEMMO) (2002) identified several systemic problems with SEMMO. For this reason, the current guideline and program is under review.

Under the poor market conditions that dominated this audit period there is tremendous pressure on SFLs to reduce costs, raising further MNR concerns about whether forest renewal investments are adequate given the lag in the FTG feedback loop. Under the current system, the SGR specifies the Silviculture Treatment Packages (STPs). The SGRs are assigned to an area through a FOP certified by a Registered Professional Forester. The SGR also describes the future forest condition and specifies the FTG standard. MNR SEM methods collect data to see if the FTG standard is being met. The current approach relies on quantitative methods that are expensive if a reasonable statistical precision is desired for each stand or block. The entire process has a long time lag to verify if the SGR is effective, hence MNR's concern and their desire for early verification of renewal status.

The cost and the lag times associated with SEM are the root cause for MNR's concerns over both definitions of FTG and what they deem to be poor renewal practices. Although the audit team and OVFI agree there is a need to improve some renewal practices on some sites, these improvements are an operational issue and were not significant enough to merit a recommendation and an action plan.

There is a difference in perception of what constitutes good forest renewal practices between MNR and OVFI just as there are differences of opinion about compliance issues. Until data collected under SEM can objectively determine the success of a renewal program, professional judgement and a respectful working relationship between MNR and the SFL must be relied upon. Unfortunately a respectful working relationship needs to be cultivated further. It is expected that by resolving the issues concerning the compliance program (see Recommendation 7), these same actions will likely resolve some of the issues associated with the forest renewal and effectiveness monitoring program. This issue will deserve careful consideration in future audits once the corrective actions have been in place and the improvements to SEM can be assessed.

3.6.4 Monitoring Indicators of Forest Sustainability

Based on the results of the IFAPP procedure sampling process, the procedure associated with this criterion was not audited.

3.6.5 Annual Report

The audit team reviewed ARs prepared for the five years of the audit period. The 2003-04 AR for the Ottawa Valley Forest was prepared under the 1996 FMPM and included both a spring submission for silviculture (due on April 15) and a fall submission containing harvesting information (due on Nov 15). ARs prepared under the 2004 FMPM consist of just one submission (due by Nov. 15). The 2004 FMPM requires that Annual Reports for the fiscal years 2004-05 and later for plans prepared under the 1996 FMPM be prepared in accordance with the requirements of the new manual to the extent reasonably possible. In addition, the AR for the last year of an FMP prepared under the 1996 FMPM must include the additional requirements associated with Year-10 ARs. This applies to the Ottawa Valley Forest 2005-06 AR.

The audit team found no significant issues surrounding the timelines under which the ARs were submitted, reviewed by MNR, and resubmitted for final acceptance/approval. Beginning with the 2004-05 AR, the audit team was able to review the submission and review history through the FI Portal.

The 2004-05 AR was not officially accepted by the FI Portal. It was first submitted on November 15, 2005 and MNR provided comments to OVFI on December 13, 2005. In January of the following year, OVFI resubmitted the revised report which was not accepted by the FI Portal validation process. The AR was resubmitted again March 2, 2006 after more edits were made and failed to be accepted by the FI Portal. A review of MNR's comments indicated that Table AR-14 was incomplete. In addition, the FTG silvicultural treatment coverage was not submitted. Assessments of regeneration success were undertaken on the Forest during the 2004-05 year but not reported.

According to FIM, "Sustainable forest license holders...must provide information for all areas which were surveyed/assessed, regardless of whether the areas have been determined to be a regeneration success or not." This issue was the culmination of a few years worth of disagreement between OVFI and MNR on interpreting the results of FTG surveys. An agreement has since been met between the two parties. All other components of the ARs were well done and complete. In fact, all ARs were the most comprehensive reviewed by the auditor and there were few evident errors, which is uncommon. The 2005-06 Year-10 AR was reviewed by the audit team and is discussed in detail in the following section.

3.7 Achievement of Management Objectives and Forest Sustainability

3.7.1 Year-10 Annual Report

The 2005-06 AR is also the Year-10 AR for the Ottawa Valley Forest. Text, tables, and maps from the 2001-02 through 2005-06 ARs were compared to the corresponding cumulative information in the 2005-06 Year-10 AR. Most records are very good. In fact, all ARs including the Year-10 AR were the most comprehensive reviewed by this auditor and there were few evident errors, which is uncommon. There were however, a few notable deviations between the cumulative information and the sum of individual ARs. For example, the total area regenerated according to a sum of ARs is 12,048 ha versus 11,337 ha included in the Year-10 AR. The amount of area assessed for FTG during the 2001-06 period also differed: 6,341 ha in the Year-10 AR and 8,097 ha according to the sum of all ARs. The audit team recognizes the complexity of monitoring and reporting various forest management activities and notes that deviations due to term-end updates are common. Therefore, no recommendation is made for this finding.

The Year-10 AR and Table AR-7 provided a review of the type and level of renewal and tending conducted in the 2005-06 year as well as the 2001-06 period. No protection activities occurred during the period. In addition, achievement and trends are compared to forecast levels from the 2001-06 FMP for each renewal and tending treatment completed. This section was well done.

The AR discussed Revenues and Expenditures for 2005-06 and the 2001-06 period. Forest Renewal Trust Funds exceeded silviculture expenditures for the term and the minimum balance was maintained as required.

The effectiveness of silvicultural treatment packages that are exceptions to the forest management guides were assessed. There were two exceptions in the 2001-06 FMP; Group Shelterwood for Red Oak and Re-treatment of Failed Uniform Shelterwood Seed Cuts - PW1. Only the white pine re-treatment exception was implemented during the plan term at one site. It was later determined that this is not an exception, so exception monitoring was not required.

The AR contained an assessment of Regeneration and Silviculture Success; Table AR-14 contained the corresponding information. This section included a good discussion of trends for several silviculture treatments and some recommended changes that may affect future effectiveness and expenditures. For example, it was suggested that some of the treatments that have not gone well will benefit from dedicated silviculture funding through the Forest Renewal Trust (FRT) Fund. It also noted that most of the results represented forest management treatments prior to dedicated silviculture funding through the FRT (pre-1995). FRT funding since 1995 has allowed more intensive and timely treatments to occur that should lead to higher rates of success in future assessments of silviculture effectiveness. There was one evident typographic error in this section, the combined regeneration and silviculture success rate was noted to be 67% and the regeneration rate 81%; however, the figures were reversed.

The AR contained the analysis of forest disturbances. The analysis accurately quantified the size and frequency of disturbances and described progress towards completion of planned forest disturbances. In Section 3.5, Assessment of Forest Sustainability, the following was provided: *Actual operations of the 2001-2006 FMP moved the frequency distribution of clearcut and wildfire sizes towards the template in*

three of four classes, which was an improvement over the projection. This was reiterated in Section 3.6, Achievement of Management Objectives. However, there was no assessment of the implications on the achievement of desired landscape pattern and no recommendations were provided for consideration in future disturbance planning. The audit team considered this a minor shortcoming and no recommendation is made.

Section 3.2 contained a review of renewal and tending activities for the 2001-06 period including a comparison of area harvested to area regenerated by plan term as provided in Table AR-16. Although there is information available to draw from within the AR there is little information in this section regarding specific renewal and tending trends. Instead some general trends are noted, for example, *changes to forest composition from 2001-2006 are consistent with the movement towards the desired future forest condition and indicate that sites are being regenerated.* However, the author further states, *It is not possible to draw meaningful conclusions from the data in AR-16 at this time (*due to incomplete and unreliable harvest records prior to 1996). No recommendation is made regarding the minimal renewal and tending trends discussion in this section because thorough documentation occurs in other sections and these are properly referenced.

The AR contained a Review of Modeling Assumptions including four recommendations made to improve future modeling. Unfortunately, information in the Year-10 AR was not available for the development of the 2006-11 FMP because of the timing of the report. Therefore, information from the Year-10 AR will be available for the development of the 2011-21 FMP.

The AR contained information related to implementation of the Action Plan for the 1998-03 IFA. The Action Plan Status Report was not due until May, 2007 so the summary of progress on the Action Plan in the 2005-06 AR is an interim report. The summary includes a thorough discussion of the progress made in implementing audit action plans for each recommendation including, as applicable, implications to future plans.

The lack of renewal performance data on the Ottawa Valley Forest requires qualitative assessments of objective achievement. This situation is in part a systemic problem with the SEMO identified to senior MNR officials in audits conducted over the last several years and through ongoing dialogue with some audit team members and the MNR. These systemic problems are being examined by MNR so another recommendation in this audit report has little value.

There are also a set of problems that are unique to the Ottawa Valley Forest. The lack of trust between MNR and OVFI found in compliance monitoring compromises the ability of both agencies to progress beyond developing a Free to Grow sampling procedure to address in a meaningful way what constitutes satisfactory renewal practices as discussed in Section 3.4.4. The current market situation creates a significant challenge for the two agencies in how to best meet plan objectives and report on outcomes with dwindling human and financial resources (see Recommendation 5).

The problems identified in the compliance monitoring section of this report (3.6.1) are the same impediments to the effective implementation and reporting on other aspects of forest management. It is expected that a successful resolution of this long standing problem will result from actions that respond to Recommendation 7.

1996-01 Report of Past Forest Operations

The 1996-01 RPFO was available during development of the 2006-11 FMP. The 1996-01 RPFO section 7.2 included 13 recommendations aimed at improving plan administration matters or assumptions used in FMP development. Some of the recommendations included specific steps that the planning team may need to take to meet the recommendation. Section 3.3.2 of the 2006-11 FMP contains a review of the recommendations from the 1996-01 RPFO including how the planning team considered and dealt with

each of the recommendations. The RPFO recommendations were well conceived and the follow up work in the 2006-11 FMP was well done.

3.7.2 Assessment of Objective Achievement

The audit team reviewed the achievement of management objectives set in the 2001-06 FMP (Table 4). Each objective is considered met unless otherwise noted. The Year 10 AR author discussed the achievement of all management objectives for the 2001-06 FMP in the text of that report and the audit team has referenced selected comments where appropriate. The audit team is in overall agreement with the Year 10 AR report author's assessment. The audit team also assessed progress towards meeting the objectives set in the current FMP (Table 5). Since this plan is not fully implemented a definitive independent review of objective achievement must await the next IFA.

Table 4. Audit team assessment of the achievement of the Ottawa Valley Forest 2001-06 FMP objectives.

Objective	Year 10 Annual Report Author's Assessment of Achievement	Audit Team Comments
3.5.2 Objectives for Forest Diversity		
To ensure that the current biological diversity of forests is not significantly changed, and where desirable and practical, is restored to reflect the pre-settlement forest.		Partially Met - Certain seral stages outside of stated acceptable range at 2006, but movement is towards target distribution overall.
To maintain the representation of uncommon tree species such as black cherry, butternut, bitternut hickory and red spruce.		Objective not carried forward to Section 3.9.3 of FMP or reported in Year 10 AR. Minimal harvest volumes of these species were reported in ARs.
Within the Madawaska Highlands planning area, to maintain, and restore over time, the representative forest types and patterns in accordance with the targets and guidelines set out in the *Madawaska Highlands Land Use Plan* (Table 14).		No comments specific to Madawaska Highlands provided in Year 10 AR.
To contribute to the provincial and regional targets for the protection of old growth pine areas.	Better information and tools necessary to plan for old growth in the long term, particularly for the shelterwood forest units.	Audit team acknowledges the problems with the current inventory. See Recommendation 2
To maintain or enhance "old growth conditions" within uneven-aged stands and within red and white pine even-aged stands.		These diversity objectives have been met by the development and field application of forest operations prescriptions. Use of group openings and skewing of the target size classes to the large and extra large categories when tree marking are appropriate actions.
To maintain the diversity of species and structural elements within forest stands, within the bounds of natural variation, and while using appropriate silviculture.		FOPs specify retention of structural components; certified tree markers implement marking prescription; limbs and tops typically left in cut block.
To maintain unique flora, and special habitat features within forest stands.		MNR maintains values information; certified tree markers identify/report new values.

Continued on next page.

Table 4 continued.

Objective	Year 10 Annual Report Author's Assessment of Achievement	Audit Team Comments
To maintain the genetic diversity of tree species.		Species diversity, structural diversity, and genetic diversity are all considered when developing tree marking prescriptions. The tree marking program has been consistent and thorough on the Forest.
To improve the distribution of all seral stages (all forest) across the management unit within 100 years.		Partially Met - Certain seral stages outside of stated acceptable range at 2006, but movement is towards target distribution overall.
Maintain or increase the representation of white pine and red pine forest.		All components are within acceptable ranges.
Minimise the loss of red oak forest types.		Forest unit within desired level. Regeneration of oak is a challenge.
Maintain or increase the representation of hemlock forest types.		Forest unit within desired level.
Maintain or increase the representation of cedar forest types.		Forest unit within desired level.
Maintain or increase the representation of black spruce forest types.		Forest unit within desired level.
Maintain or increase the representation of jack pine forest types.		Forest unit within desired level.
Increase the proportion of undisturbed (not seed cut) white and red pine forest types in age classes greater than 120 years.		Forest unit within desired level.
3.5.3 Social and Economic Objectives		
To maintain the ecological and productive capacity of the forest in order to provide society with forest-based material and social values.		Harvest levels were regulated, site productivity was maintained and appropriate silvicultural prescriptions were applied.
3.5.3.1 Economic Objectives		
To meet the anticipated demand for forest products by the forest industry, today and in the future, utilising the full range and volume of species and products, while maintaining forest sustainability.	Achieved for white and red pine, but not for hardwood sawlogs, hardwood veneer or poplar. Meeting industrial demand for hardwood sawlogs and veneer is a long term objective that requires improvement of the forest condition. The demand for poplar during the 2001-06 term exceeded sustainable supply; the maximum sustainable volume of poplar was used as the plan target. As of 2006 the future demand for most species and products looks uncertain.	Agree

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Table 4 continued.

Objective	Year 10 Annual Report Author's Assessment of Achievement	Audit Team Comments
To provide for participation in the harvest allocation by the Algonquin First Nations.	Algonquins of Pikwakanagan received a harvest allocation of 500 ha (2.3% of the AHA) during the 1996-01 term. Inaccuracies in the FRI resulted in a substantial area of their allocation being bypassed, and on principle, the community withdrew from an allocation in the Pakotinna 'area of interest'. A deal was struck to have their contractor conduct harvest operations on Shaw's allocation outside of the area of interest to offset the lost volume/harvest opportunity.	First Nation experienced some challenges during this time in harvesting the allocation but it was eventually cut.
To manage the forest cover, using appropriate silviculture, to provide and protect tourism values.	No specific targets associated with this objective as no specific tourism values have been identified.	Agree
To manage forest cover for the protection and enhancement of fish habitat, contributing to the health of fish populations, and their sustained use for food, employment and recreation.	No specific targets associated with this objective.	FOPs prepared for all harvest areas; MNR maintains values information; AOC prescriptions prepared and implemented.
To manage forest cover for the protection and enhancement of wildlife habitat, contributing to the health of wildlife populations and their sustained use for food, employment, hunting and viewing.	No specific targets associated with this objective.	FOPs prepared for all harvest areas; MNR maintains values information; AOC prescriptions prepared and implemented.
3.5.3.1.1 Timber Production Objectives		
To maintain a minimum harvest level of 260,000 m^3/year of Primary volume over the next ten years (first term of SFMM).		Partially Met - Strategic planning was conducted to project a primary harvest volume of 260,000 m^3 per year from the AHA from the selected management alternative for the 2001-06 term. The full AHA for the 2001-06 FMP term was allocated for harvest. Implementation from 2001-06 achieved only 86% of planned harvest area projections which reduced the actual harvest volumes realized, however the area and volume was available to be utilized.

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Table 4 continued.

Objective	Year 10 Annual Report Author's Assessment of Achievement	Audit Team Comments
To ensure a long-term predictable supply of forest products to the industry by: a) ensuring that the minimum harvest level meets or exceeds 235,000 m^3/year of Primary volume for the entire planning horizon (100 years); b) minimising fluctuations in Primary volume harvested between terms (zero fluctuation being the ideal).		a) Strategic planning was conducted to project a minimum primary harvest volume of 252,000 m^3 per year throughout the next 100 years. b) Partially Met - Strategic planning incorporated a predicted 10% decrease in harvest volumes from the 2001-11 to 2011-21 terms. Harvest volumes were projected to be relatively stable thereafter, but a decrease for the 2001-06 plan term was accepted by the planning team in order to balance all objectives.
To ensure that the harvest provides, as a minimum, the following harvest levels for the three main product groupings over the next ten years: • 70,000 m^3 of white pine and red pine (PwPr); • 70,000 m^3 of poplar and white birch (PoBw); and • 70,000 m^3 of tolerant hardwoods (Tol).		Strategic planning was conducted to project minimum annual harvest volumes of 83,000 m^3 white pine and red pine (PwPr), 107,000 m^3 poplar and white birch (PoBw) and 70,000 m^3 of tolerant hardwoods (Tol).
To improve the supply of quality, high value timber (sawlogs, veneer and poles) over time.		Tree marking program endeavours to increase AGS component of each stand marked at each intervention (until final removal in shelterwood managed stands).
To control harvest and silviculture costs by: a) Minimising fluctuations in total area harvested from planning term to planning term (ideal being zero fluctuation). b) Minimising fluctuations in area harvested in each forest unit from planning term to planning term (ideal being zero fluctuation).		a) Strategic planning was conducted to limit projected changes in total available harvest area to ±10% from the previous term. b) Strategic planning was conducted to limit projected changes in the AHA by forest unit to within 20% change from the previous term. (Note: The actual implementation of harvest area during the 2001-06 term created a greater variation than planned, the difference was 15% variation due to not harvesting the full AHA, however the objective target was met through strategic planning for the long-term.)

Continued on next page.

Table 4 continued.

Objective	Year 10 Annual Report Author's Assessment of Achievement	Audit Team Comments
3.5.3.1.2 Resource Access Objectives		
To provide access to the forest resources of the Ottawa Valley Forest by developing and maintaining a forest access network over time, which is appropriate for the purpose and frequency of use, and consistent with: • maintaining forest sustainability; • forest management objectives, and objectives of other resource management plans; • private landowner rights; • requirements of Ontario Hydro and Trans Canada Pipelines; • preserving the remote features in accordance with the Madawaska Highlands Land Use Plan, and Ontario's Living Legacy – Enhanced Management Areas; • public safety.		The program of access development, maintenance and decommissioning, as described in the FMP, was generally implemented, and supported the various access objectives set out in the plan.
3.5.3.2 Social Objectives		
To manage forest cover, using appropriate silviculture, for the protection and enhancement of recreation opportunities.		Selection and shelterwood harvest systems complement recreational objectives requiring protection of visual aesthetics.
To encourage and facilitate outdoor and environmental education opportunities in the Ottawa Valley Forest in order to promote the concept of sustainable forests.	No specific targets. In partnership with OVFI, the Algonquin College Forest Technician program uses the forest for a variety of training exercises such as tree marking, fire prevention and compliance inspection. During the 2001-06 term, the SFL has involved the Ontario Rangers, the Stewardship Rangers, high school co-op students, and Algonquin College students in hands-on experiences in forest management. During the 2001-06 term the SFL has provided work placement opportunities directly with the SFL company and indirectly as or with silvicultural contractors.	Agree

Continued on next page.

Table 4 continued.

Objective	Year 10 Annual Report Author's Assessment of Achievement	Audit Team Comments
To promote and facilitate use of the Ottawa Valley Forest to demonstrate the principles of sustainable forestry to private landowners and to other jurisdictions.	No specific targets. OVFI is a member of the Renfrew County Stewardship Council and their Forest Stewardship Committee, which has begun a demonstration forest initiative. Pine management demonstration sites have been established on the Petawawa Research Forest, and other potential demonstration sites (including Crown land) have been identified across the County. The committee's woodlot days focus on a different woodlot site each year.	Agree
To make forest environments available for research and technology development related to developing the science and practice of sustainable forestry, and for monitoring ecosystem health.	No specific targets. To date the only formal demonstration settings established and used in the Ottawa Valley Forest are the Algonquin College tree marking plots.	Agree
To ensure significant features of cultural heritage are considered and protected from any impact from forest management activities.	No specific targets	Values maintained by MNR or Ministry of Culture and; AOC prescriptions for high potential and known cultural heritage values.
3.5.4 Objectives for Other Values Dependent on Forest Cover		
To plan and implement forest management to maintain, and where desirable, improve forest conditions for natural values dependent on forest cover, while achieving sustainable use of the forest resources.	No specific targets	AOC prescriptions developed and implemented.
On a landscape basis, to maintain habitats for all indigenous wildlife, and where desirable, improve forest conditions for featured wildlife species.	No specific targets	Nonspatial or spatial habitat assessment conducted for selected species during planning.
To maintain critical habitat features within forest stands in accordance with sound silviculture.	No specific targets	Hemlock management in deeryards seen on the field visits was particularly successful.
To manage forest cover to provide the habitat conditions essential to the success of unique and rare flora and fauna.	No specific targets	AOC prescriptions implemented for species at risk.
To manage forest cover for the protection and enhancement of water quality and fish habitat.	No specific targets	AOC prescriptions developed and implemented.

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Table 4 continued.

Objective	Year 10 Annual Report Author's Assessment of Achievement	Audit Team Comments
To manage forest cover for the protection and enhancement of significant natural heritage values, forest aesthetics and remoteness.	No specific targets	Selection and shelterwood harvesting practices support objective.
3.5.4.1 Objectives for the Provision of Habitat for Some Featured Species		
3.5.4.1.1 Moose and Deer		
On a landscape basis, to maintain a minimum of 51,458 hectares of preferred moose early winter habitat, while meeting other objectives.	This objective can not be assessed as moose early winter habitat has been dropped from the Southern Region Wildlife Habitat Matrix.	Agree
On a landscape basis, to maintain a minimum of 11,407 hectares of preferred white-tailed deer winter habitat, while meeting other objectives.		Section 3.9.3 of FMP set target at 12,240 ha. Modelling projects habitat levels above minimum desirable amount, although nonspatial nature of data was an issue addressed in 2006-11 FMP.
On a site-specific basis, to maintain and protect special habitat features such as calving sites and aquatic feeding areas, and to improve moose winter cover where good moose winter cover is lacking.	.	Specific habitat features documented on values maps; protected through prescriptions consistent with guideline requirements.
On a site-specific basis, to improve white-tailed deer winter habitat where the combinations of good winter cover and winter browse are lacking.	No specific targets associated with this objective. The approach to deer yard management has been improved significantly in the 2006-11 FMP, by beginning to assess each yard to identify existing critical habitat features and to determine habitat needs.	Agree
3.5.4.1.2 Pileated Woodpecker		
On a landscape basis, to maintain a minimum of 87,507 hectares of preferred pileated woodpecker habitat, while meeting other objectives.		Modelling projected habitat levels above minimum desirable amount.
On a site-specific basis, to provide and maintain stand level habitat features for the pileated woodpecker.		Guidelines followed; certified tree markers identify wildlife trees at stand level.
3.5.4.1.3 Red-shouldered Hawk		
On a landscape basis, to ensure no net loss of preferred habitat for red-shouldered hawk from 2001 to 2006, and optimally, to achieve a 10% increase in preferred habitat over the next 100 years (*Madawaska Highlands Land Use Plan*).	Spatial assessment of red shouldered hawk habitat during the development of the 2006-11 FMP, showed preferred habitat in 2006 had increased to 14,400 ha.	Agree
To retain and protect special habitat features in forest stands that are essential to red-shouldered hawk breeding success.		Nests reported as encountered; MNR maintains values database; AOC prescription developed.

Continued on next page.

Table 4 continued.

Objective	Year 10 Annual Report Author's Assessment of Achievement	Audit Team Comments
3.5.4.1.4 Ruffed Grouse		
On a landscape basis, to achieve a minimum of 31,902 hectares of preferred habitat for ruffed grouse, while meeting other objectives.	Target for 2006 based on the 2001 version of the Wildlife Habitat Matrix and development stage definitions. After adjustment to the new matrix, preferred ruffed grouse habitat decreased by 35% between 2001 and 2006 due to the aging of the forest.	Agree
On a stand level, to manage intensively for special habitat features in potential prime ruffed grouse habitat, while meeting other objectives.	Five ruffed grouse habitat projects were conducted in partnership with the Ottawa Chapter of the Ruffed Grouse Society of Canada, and Pembroke MNR.	Met
3.5.4.1.5 White-throated Sparrow		
On a landscape basis, to achieve a minimum of 11,407 hectares of preferred habitat for white-throated sparrow, while meeting other objectives.	Target for 2006 based on the 2001 version of the Wildlife Habitat Matrix and development stage definitions. After adjustment to the new matrix, preferred white throated sparrow habitat increased by 9% between 2001 and 2006.	Agree
3.5.5 Forest Renewal and Tending Objectives (Objectives for Silviculture)		
To ensure every forest stand harvested on the Ottawa Valley Forest is renewed, and tended as required, by the most appropriate and cost effective methods to achieve the desired future forest condition, in accordance with the Silvicultural Ground for each forest unit.	The five year objectives have been met or exceeded for most renewal and maintenance activities. There is some question whether the level of site preparation is appropriate or being appropriately forecasted. More effort to implement chemical site preparation in 2006-2011 is required. Harvest, regeneration and silvicultural success are difficult to reconcile due to the paucity of reliable information.	Currently On Track – Silviculture program has met needs of the forest to date. There is some concern by MNR that the program is too austere but results seen on the field visit by the audit team indicate that the program is working. Careful monitoring of results will be important to verify that further success is imminent.
To ensure that all harvested areas are monitored to ensure that the regeneration standards are achieved in accordance with the Silvicultural Ground Rules for each forest unit.	No specific comments in Year 10 AR	See above.
To continue to research, test, and implement viable, economical and ecologically based alternatives for forest renewal and maintenance.	Only one formal monitoring project was established during the term of the 2001-2006 FMP	See above.

Continued on next page.

Table 4 continued.

Objective	Year 10 Annual Report Author's Assessment of Achievement	Audit Team Comments
To ensure that silviculture renewal funds meet the needs of the silviculture program. (i.e. that Forest Renewal Trust funds are sufficient to meet silviculture expenditures)	Revenues to the FRTF have exceeded silviculture expenditures in both the 1996-2001 and the 2001-2006 terms. During this same period, Ottawa Valley Forest Inc. has also been very successful in securing additional funds from the Forestry Futures Trust to pay for incremental silviculture projects to renew backlog areas, and to improve growth in young forests.	See above.

Source: 2001-06 FMP for the Ottawa Valley Forest.

Table 5. Audit team review of the progress towards achievement of management objectives of the Ottawa Valley Forest 2006-11 FMP.

Objective	Audit Team's Assessment of Progress Toward Achievement	Audit Team Comments
Objective for Forest Diversity		
Landscape Level Objectives for Forest Diversity		
FD-1: Improve the distribution of all seral (development) stages (all Forest) across the management unit by the year 2101.	On Track	Specific constraints were included in the selected management alternative to ensure improved proportions for forest development stages through time. Implementation of planned harvest based on the SMA should provide for objective achievement.
FD-2: Maintain or increase the representation of white pine and red pine forest from 2001 levels.	On Track	Specific inputs were included in the selected management alternative to ensure no loss of PR1 and PW1 forest unit areas through time, as well as no loss in the PWR forest unit group (PR1+PR3+PW1+PW2 forest units). These inputs ensured that any losses in area of the PR3 or PW2 forest units would be offset by increases in the PR1 and PW1 forest units. Implementation of planned harvest and forecast renewal strategies should provide for objective achievement.
FD-3: Minimise the loss of the OR1 forest unit from 2001. Maintain above 30,454 ha (80% of 2001).	On Track	The selected management alternative projects OR1 forest unit area decreasing through time from 2006 (38,067 ha) to 2156 (31,762 ha) which remains above the stated minimum target of 30,454 ha. Implementation of planned harvest and forecast renewal strategies should provide for objective achievement. Recognize that red oak regeneration can be challenging.

Continued on next page.

Table 5 continued.

Objective	Audit Team's Assessment of Progress Toward Achievement	Audit Team Comments
FD-4: Maintain the representation of the HE1 forest unit from 2001.	On Track	The selected management alternative projects HE1 forest unit area maintained at 2,256 ha from 2006 through time due to shelterwood harvest and renewal strategies that maintain area within the hemlock forest unit. Implementation of planned harvest and forecast renewal strategies should provide for objective achievement.
FD-5: Maintain the representation of the CE1 forest unit from 2001.	On Track	The CE1 forest unit has 4,972 ha in 2006 and is projected to increase in ten years to 5,131 ha. This projection from the selected management alternative remains above the minimum stated target of 4,791 ha.
FD-6: Maintain or increase the representation of the PJ1 forest unit from 2001.	On Track	The PJ1 forest unit has 1,965 ha in 2006 and is projected to be maintained for 30 years then increase to 2,162 ha. This projection from the selected management alternative is below the minimum stated target of 2,014 ha at Plan Start 2006, but target level is expected to be achieved by 2036.
FD-7: Increase the representation of diminished forest types within forest units: • red spruce, white spruce in CM1; and • yellow birch in HD1.	On Track	The use of group selection and uniform shelterwood on micro sites within the HD1 forest unit to promote the establishment, or encourage the regeneration, of mid-tolerant species such as Yellow Birch is appropriate, as is the artificial regeneration of red spruce and white spruce in the CM1 forest unit.
FD-8: *(meeting the requirements of the Old Growth Policy)* Increase (from 2.2%, 2001) and maintain the area of old growth white and red pine communities to a minimum of 20% of total white and red pine forest area. Target is 20 years. White and red pine communities are defined as the area in the PW1, PW2 and PR1 forest units.	On Track	The Selected Management Alternative was developed to ensure old growth white pine and red pine communities increased to 22% representation over next 10 years therefore implementation of planned operations should lead to objective achievement.
FD-9: *(meeting the requirements of the Old Growth Policy)* Maintain representation of old growth forest in all forest units within the bounds of natural variation. These targets are projections from the Selected Management Alternative influenced only by the objective for old growth white and red pine, other objectives for wildlife habitat, and maintaining the area in mature, late and uneven forest within the bounds of natural variation (±20% of the Natural Benchmark Scenario).	On Track	Strategic modeling during development of the FMP considered provision of old growth forest area by forest unit, however no specific targets were set other than to remain within the estimated bounds of natural variation. Implementation of planned operations in accordance with the selected management alternative will lead to achievement of this objective.

Continued on next page.

Table 5 continued.

Objective	Audit Team's Assessment of Progress Toward Achievement	Audit Team Comments
FD-10: *(meeting the requirements of the Forest Management Guide for Natural Disturbance Pattern Emulation)* Maintain landscape patterns within the bounds of natural variation while moving the frequency distribution of forest disturbance patch sizes towards the template for Site Districts 5E-10 and 5E-11.	On Track	Harvest areas in the 2006-11 FMP were planned to create forest disturbances in size classes that will (overall) move the landscape pattern towards the natural disturbance pattern template for the forest. Implementation of the FMP planned harvest activities will facilitate achievement of this objective, however it must be recognized that any natural disturbances that occur will also impact objective achievement, either positively or negatively.
Stand Level Objectives for Forest Diversity		
FD-11: *(meeting the requirements of the Old Growth Policy)* Increase the representation of old growth conditions in managed uneven-aged stands.	On Track	This objective was not able to modeled specifically in the SFMM model, but rather is related to operational practices of retaining additional larger trees during harvest and retaining a minimum basal area with the selection silvicultural system during plan implementation. The practice was seen on the field visit from the air and on the ground.
FD-12: Protect critical or sensitive habitats of featured species (as listed in Sec. 2.2.5.9) within Managed forest stands.	On Track	Values information maintained by MNR. New values reported as discovered. AOC prescriptions implemented.
FD-13: Maintain the diversity of tree species (except where this conflicts with silvicultural strategies to achieve objectives FD-2 to FD-7) and structural elements within Managed stands.	On Track	The tree marking program specifically addresses diversity of tree species and stand structure through tree marker training and the development of detailed forest operations prescriptions.
FD-14: Identify and protect sensitive forest sites (Protection Forest).	On Track	There was no evidence of site damage on any sites viewed by the audit team. Protection Forest sites are not scheduled for operations.
Genetic Level Objectives for Forest Diversity		
FD-15: Protect known populations and individual trees of species that are uncommon or at the extremes of their range (i.e. butternut, bitternut hickory, white oak, red spruce, red cedar) or of Species at Risk status (butternut).	On Track	Viewed at stop number 34 from the air and ground. Butternut trees were identified for protection by tree markers and group openings were installed to try to encourage establishment of regeneration. The openings were filled with herbaceous competition. Ongoing monitoring of these specific sites would be appropriate.
FD-16: Maintain the genetic diversity of the common tree species of the management unit.	On Track	Genetic diversity is protected by careful tree marking and the collection of local cone for seedling production.
Social and Economic Objectives		
Objectives for Timber Production		
SE-1: To the extent possible, meet the anticipated demand for forest products by the forest industry today and in the future.	On track for most species	Demand outstrips long term even flow harvest levels for poplar and white birch.

Continued on next page.

Table 5 continued.

Objective	Audit Team's Assessment of Progress Toward Achievement	Audit Team Comments
SE-2: Ensure a long-term predictable supply of forest products to the industry that minimises fluctuations in volume harvested for the three main species groupings to <=10% between forest management plan terms (i.e. white and red pine, poplar and white birch, tolerant hardwoods).	On Track	Strategic modeling for the Selected Management Alternative in the 2006-11 FMP included specific constraints on the allowable fluctuation between 10-year terms in harvest volumes by species group. Variation in harvest volumes for these major species groups were limited to a maximum decrease or increase of 9% from the previous term. Therefore, as long as implementation of the selected management alternative continues as planned in the FMP, this objective should be achieved.
SE-3: Minimise fluctuations in total area harvested between planning terms to <=10% and minimise fluctuations in area harvested in each forest unit between planning terms to <=20%.	On Track	Strategic modeling for the Selected Management Alternative in the 2006-11 FMP included specific constraints on the allowable fluctuation between 10-year terms in harvest areas (total and by forest unit). Variation in total harvest area was limited to a maximum decrease or increase of 10% from the previous term. Forest units were individually constrained to ±20% variation. Therefore, as long as implementation of the selected management alternative harvest area continues as planned in the FMP, this objective should be achieved.
SE-4: Fully utilise the forecast harvest volume made available (FMP-20, FMP-23) from the planned harvest area (FMP-18, FMP-22) during the term 2006-2011.	Current Issues	Objective may not be met due to slow down in demand, especially for white pine.
SE-5: Improve the proportion of high value species and products, particularly white pine, red pine and tolerant hardwood sawlogs over time.	On Track	Tree marking contributes to improved stand conditions in selection and shelterwood harvest blocks.
SE-6: Identify and implement ways of achieving more equal participation by Algonquin First Nation communities in the benefits provided through Forest Management Planning.	On Track	Algonquins of Pikwakanagan is an associate member of the SFL with a harvest of allocation 2.3% of the AHA. A shareholder and an OLL committed to providing 350 ha of contract harvesting and renewal and tending work to interested participating Algonquin communities (none accepted opportunity to-date). Existing Aboriginal contractors continue to work on the Forest. Four communities participated on the planning team for the 2006-11 FMP. Community leaders invited to field inspections of high potential cultural heritage sites.
SE-7: Provide opportunities for the public to harvest personal use fuelwood from logging residues.	On Track	Over 1,100 m^3 reported as harvested in 2006-07.

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Table 5 continued.

Objective	Audit Team's Assessment of Progress Toward Achievement	Audit Team Comments
Objectives for Resource Access		
SE-8: Develop, and manage the use and abandonment of forest access roads and water crossings that meet the needs of the forest industry, ensures public safety and minimises risk to the environment.	On Track	Access program in FMP is being implemented; no significant issues observed.
Objective for Recreation and Tourism		
SE-9: To manage the forest cover to provide and protect recreation and tourism values.	On Track	Management prescriptions and practices are conducive to protection of visual aesthetics.
Objective for Fisheries		
Se-10: To manage forest cover for the protection and enhancement of fish habitat, contributing to the health of fish populations, and their sustained use for food, employment and recreation.	On Track	Riparian buffers and reserves implemented to protect aquatic habitats.
Objective for Wildlife and Fur		
SE-11: To manage forest cover for the protection and enhancement of wildlife habitat, contributing to the health of wildlife populations and their sustained use for food, employment, hunting and viewing.	On Track	Harvest allocations and silviculture prescriptions consider habitat requirements such as diversity of forest cover types, maintenance of structural components, and protection of special features.
Objectives for Education, Demonstration and Research		
SE-12.1: Encourage and facilitate outdoor and environmental education opportunities in the Ottawa Valley Forest in order to promote the concept of sustainable forests.	On Track	OVFI is active in various education initiatives; Positive comments made by LCC regarding OVFI efforts.
SE-12.2: Make forest environments available for research and technology development related to developing the science and practice of sustainable forestry, and for monitoring ecosystem health.	On Track	Examples include participation in a red oak acorn viability study, white pine removal trial, NSERC/Trent University investigation of selection harvest regimes.
SE-12.3: Participate with Algonquin First Nation communities in developing forestry awareness, and in training First Nation forest technicians, foresters and forest operators.	On Track	OVFI hired Algonquins of Pikwakanagan forester to preview potential allocations. OVFI and MNR supported the Pikwakanagan Earthwalker program with money to help fund operating expenses. OVFI also provided forest management work and learning opportunities. OVFI representative participates on the Algonquin Land claims Committee of External Advisors. MNR provided funding for an Algonquin to work with a qualified lumber grader for a five week period to acquire experience.
SE-13: Ensure significant features of cultural heritage are considered and protected from any impact from forest management activities.	On Track	Algonquin community leaders invited to field inspections of high potential cultural heritage sites. Cultural heritage values information maintained in NRVIS database; AOC prescriptions implemented.

Continued on next page.

Table 5 continued.

Objective	Audit Team's Assessment of Progress Toward Achievement	Audit Team Comments
Objectives for Other Values Dependent on Forest Cover		
OV-1: Maintain habitats for all indigenous wild life.	On Track	Harvest allocations and silviculture prescriptions consider habitat requirements such as diversity of forest cover types, maintenance of structural components, and protection of special features.
OV-2: Manage forest cover and forest management activities for the protection and enhancement of water quality and fish habitat.	On Track	Riparian buffers and reserves implemented to protect aquatic habitats and water quality.
OV-3: Manage forest cover and forest management activities for the protection of provincially and locally significant wetlands.	On Track	Riparian buffers and reserves implemented to protect aquatic habitats and water quality.
Objectives for the Provision of White-tailed Deer Habitat		
OV-4.1: Optimise the availability/balance of deer habitats Spatially and through Time	On Track	Harvest and silviculture practices support maintenance of deer habitat.
OV-4.2: Improve and maintain Summer Habitats for Deer in the Ottawa Valley Forest.	On Track	Harvest and silviculture practices support maintenance and creation of summer habitat.
OV-4.3: Improve and maintain Wintering Habitats for Deer in the Ottawa Valley Forest.	On Track	Significant improvements to assessment of deer yard habitat; deer yard AOC prescription applied.
OV-4.4: Increase the availability of critical thermal cover to a target level of 20% and/or work towards an even distribution of critical cover in each of the four (4) deer yards with >25% crown land.	On Track	Significant improvements to assessment of deer yard habitat; deer yard AOC prescription applied; focus on protection and renewal of critical conifer thermal cover.
OV-4.5: Increase the availability of browse to an average of 20 kg/ha in each of the four (4) deer yards with >25% crown land (using OWHAM).	On Track	Strategies developed to increase browse over time.
Objectives for the Provision of Moose Habitat		
OV-5.1: Maintain overall carrying capacity for moose within Wildlife Management Units 48, 55a and 55b.		Harvest practices, in particular small clearcuts, support the production of moose habitat; reductions in actual harvest levels could impact achievement of five year target.
OV-5.2: Maintain and protect special moose habitat features such as calving sites and aquatic feeding areas.	On Track	MNR maintains values information; AOC prescriptions for moose calving areas and aquatic feeding areas.
Objectives for the Provision of Red-Shouldered Hawk Habitat		
OV-6.1: Ensure no net loss of preferred habitat for red-shouldered hawk from 2001 to 2011, and optimally, to achieve a 10% increase in preferred habitat by 2101. (Meets the requirements of the Madawaska Highlands Land Use Plan)		Modeling projects 2% decrease in preferred habitat over five year period; no projections beyond 2011.
OV-6.2: Retain and protect special habitat features in forest stands that are essential to red-shouldered hawk breeding success.	On Track	Nests reported as encountered; MNR maintains values database; AOC prescription developed.

Continued on next page.

Table 5 continued.

Objective	Audit Team's Assessment of Progress Toward Achievement	Audit Team Comments
Objectives for the Provision of Pileated Woodpecker Habitat		
OV-7.1: Maintain a minimum of 84,804 hectares of preferred pileated woodpecker habitat from 2001 to 2101.	On Track	Modelling shows long term decline in preferred habitat but habitat levels remain above minimum desirable amount.
OV-7.2: Provide and maintain stand level habitat features for the pileated woodpecker.	On Track	Guidelines followed; certified tree markers identify wildlife trees at stand level.
OV-8: Achieve and maintain a minimum of 35,419 hectares of preferred habitat for ruffed grouse during the period 2001 to 2101.	On Track	Modelling shows long term significant increase in preferred habitat well above minimum level.
OV-9: Achieve and maintain a minimum of 36,392 hectares of preferred habitat for white-throated sparrow during the period 2001 to 2101.	On Track	Modelling shows long term significant increase in preferred habitat well above minimum level.
Forest Renewal and Tending Objectives (Objectives for Silviculture)		
SI-1: To ensure every forest stand harvested on the Ottawa Valley Forest is renewed, and tended as required, by the most appropriate and cost effective methods to achieve the desired future forest condition. All areas harvested will be renewed in accordance with the Silvicultural Ground Rules (Table FMP-10). Targets for the 2006-2011 period are detailed in FMP-25	On Track	The renewal and tending efforts on the Ottawa Valley Forest, viewed by the audit team, were cost effective and appropriate. The instances of perceived inappropriate activity (e.g. missed patches in tending blocks, "green" patches in mechanically site prepared ground) were discussed by MNR and OVFI. In some instances, contractors were required to re-do work.

Source: 2006-11 FMP for the Ottawa Valley Forest

3.7.3 Year-10 Annual Report Determination of Forest Sustainability

The Year-10 AR contained the assessment of sustainability. This section was very thorough and included all components required of the FMPM. The conclusions and recommendations were thoughtful and appropriate to the findings.

3.7.4 Comparison and Trend Analysis of Planned vs. Actual Forest Operations Report

The review of the Comparison and Trend Analysis of Planned vs. Actual Forest Operations Report found that the report was prepared in accordance with the requirements of Appendix C of the IFAPP. An earlier draft had several errors that were corrected by the report author. The analysis appended to this report contains information that matches the source documents and is complete and accurate.

The analysis report gave a thorough description of the challenge of detecting trends when forests amalgamate, reporting requirements vary and forest classification methods change over time. Each table clearly showed the sources used to compile the analysis.

There was a steady decline in planned harvest area due to land use decisions and the introduction of new guidelines and policies that conserve forests for non consumptive uses. Some of the decline might be associated with an aging forest but given the limitations of the FRI as described in previous sections; this factor may or may not be significant.

The planned harvest volume also declined over time but the actual harvest volume remained steady and now aligns with planned levels. This trend of wood supply meeting rather than exceeding demand underscores the need to ensure forest inventory data are up to date and accurate. Moving to a continuous forest inventory may be the best method to acquire these data. Further restrictions to wood supply will have negative socio-economic impacts.

The analysis suggested that regeneration success is 100% but estimating silvicultural success and reporting upon this success is a problem. These problems were discussed in Section 3.6.3 of this report and some important corrective actions have already taken place.

In conclusion, the trends analysis, despite problems with FRI and changing classification systems, used the best available information and the author provides a good description of the trends and variances that are consistent with the audit team's general observations. The complex forest structure, history and operating environment associated with the Ottawa Valley Forest leads to reporting and interpretation challenges. The author does a commendable job of meeting these challenges providing explanations of the trends with historical context. The author also provides thorough descriptions of the sources, the strengths and weaknesses of these data.

3.7.5 Conclusions Regarding Sustainability of the Ottawa Valley Forest

In developing its conclusions regarding sustainability of the Ottawa Valley Forest the audit team considered information from a number of sources, principally the:

- 2001-06 FMP; 2006-11 FMP
- 2003-04 to 2006-07 ARs
- Year 10 AR
- Comparison and Trend Analysis Report
- 2003 IFA Audit Action Plan Status Report
- Field observations from 43 field stops

The audit team acknowledges, as did the Year 10 AR author, the current challenges in evaluating forest sustainability using the measures prescribed in the FMPM. Trends in measureable indicators of sustainability rely on consistency in the variables and basic assumptions used in the assessment through time, and on adequate amounts of data to reliably reveal trends. Unfortunately, these requirements have not been particularly well satisfied. For example, definitions of some variables changed between the 2001-06 and 2006-11 FMPs rendering direct comparisons impossible. The requirement to track indicators of sustainability has only been in place since 1996; so long term information from which to establish trends is some time away.

Despite these confounding factors, the various measurable indicators of sustainability tracked during forest management remained generally within acceptable levels between the two planning terms. For example, total productive Crown land did not change significantly although the area available for timber production declined. Actual harvest area also declined significantly, reflecting both declines in the available harvest area and in market conditions, while utilization of the available harvest area increased.

The forest is well managed by competent staff. Management objectives set during planning were generally met or are on track to being met. Information on nontimber forest values was routinely collected and appropriate prescriptions implemented to protect known or newly discovered values during forestry operations. Harvest levels were regulated and harvest and silviculture prescriptions were appropriate to the forest types on the Ottawa Valley Forest and were properly implemented on the field sites viewed. OVFI and MNR staff made adjustments to management practices based on knowledge gained through experience (e.g. lengthening return harvest cycles to reflect growth rates, planting white pine shelterwood rather than relying on natural seed sources).

Silvicultural effectiveness monitoring has been slow to evolve to point were trends and the effectiveness of various practices can be assessed with sufficient levels of objective data and statistical rigour. In this environment, reliance on professional judgement and a mutually respectful working relationship between MNR and OFVI is critically important. There remain different opinions between MNR and OFVI on the appropriateness of some of the renewal practices on some sites. Future audits should determine if the corrective actions underway and the improvements to SEM are effective in resolving this issue.

The forest management practices observed by the audit team will likely support the goals of providing for long term forest ecosystem health. Timber from the Ottawa Valley Forest helped support numerous area wood processing facilities and provided a significant contribution to the area economy, albeit with wages that are generally lower than the Ontario forest industry average. An area First Nation also received direct economic benefit from timber harvesting on the Forest and input from the Local Citizens Advisory Committee indicated a general sense of satisfaction with management of the Forest. The Forest provided a wide range of benefits to other forest users. The observations are consistent with the principles of sustainable forest management.

The audit team concluded that forest sustainability is being achieved on the Ottawa Valley Forest.

3.8 Contractual Obligations

3.8.1 Sustainable Forest Licence

Forestry Futures and Ontario Crown Charges

In Ontario, forest products companies pay a stumpage fee to the Crown for every cubic metre of timber harvested. A market-based pricing system is used by MNR to calculate this fee. Based on information provided by MNR's Forest Business Services, three overlapping licensees operating on the Ottawa Valley Forest had outstanding balances owing to the Minister of Finance for stumpage fees as of March 31, 2008. One licensee is responsible for the bulk of the balance owing (83%) dating back to an FRL issued for the 2003-2004 operating year. The licensee in question did not hold a forest resource licence to harvest on the Ottawa Valley Forest for the remainder of the audit period. The SFL holder, OVFI, had no outstanding balances owing for Ontario Crown Charges as of March 31, 2008.

The Forestry Futures Trust was established to essentially serve as an insurance policy for the Province, ensuring that forest renewal activities can be carried out in the event of natural depletions of the forest (e.g. fire, other natural causes) or when a major licensee becomes insolvent. In addition it also has funds available for intensive stand management and pest control on Crown forests. As of March 31, 2008, the SFL holder, OVFI, had no outstanding balances owing to the Forestry Futures Trust.

Wood Supply Commitments and Overlapping Licences

Wood Supply Commitments consist of a volume supply agreement in Appendix E to Grant Forest Products Inc. (GFP) of 3,800 m^3/yr. The specified volume was met or exceeded during the audit period but concern for meeting future poplar wood supply agreements is expressed in the recent FMP and the most recent Annual Report.

The SFL condition in Appendix E specifies that a copy of the Memorandum of Agreement (MOA) negotiated as a result of this condition of the SFL must be provided by the Company to the Ministry upon request. There are a number of other management units where there are no signed MOAs in place with GFP, a situation that did not pose a concern with the GFP representative.

There are also commitments in Appendix F that provide a proportion of wood cut by the Shareholders be available to the open markets and 2.5% portion of the allocation to BMSFA by a tendered sale. There is also a 2.3% portion of the AHA to Algonquin's of Golden Lake and a commitment to make wood waste

available in cutovers for fuel wood. These commitments were honoured in the development of the forest management plans and were reported upon in the ARs.

The previous IFA suggested eliminating some of the clauses in appendix F questioning their utility and whether or not the current reporting system can track compliance with the conditions. The Company and MNR agreed to eliminate the clauses for the open market requirements because the wood is moving to fulfill local mill needs guided by market forces without the need for the direction of the SFL requirements. This change will reduce the tracking and reporting requirement to the SFL holder. The SFL has yet to be amended to reflect this agreement.

The majority of wood harvested on the Forest is cut by overlapping licensees who are also shareholders of OVFI. The field site portion of the audit viewed operations conducted by most of the OVFI shareholders and the results of those observations are discussed in Section 3.4.

Manuals

OVFI prepared the required FMPs, AWSs and ARs during the audit term. The quality of these documents was high. The Company collected new values information during routine field operations and submitted this information to MNR. OVFI also conducted regeneration surveys, updated the FRI, monitored roads and water crossings, and carried out separate monitoring of access controls employed on the Madawaska Highlands.

Natural Disturbance and Salvage

A total of 144,564 m^3 was recovered from salvage operations during the 2006-07 period in a manner consistent with the SFL contractual obligations.

Forest Protection

There were no pesticide applications that required the participation of the SFL holder for forest protection purposes during the audit term.

Performance Reviews

An IFA was conducted on the Ottawa Valley Forest in 2003 for the 1998-03 term. A total of 23 recommendations (including licence extension) were made. The audit report was submitted on March 10, 2004 (date on report cover), and the audit action plan was dated as prepared on March 31, 2005 and fully approved on May 9, 2005 (letter from Director of Forest Management Branch). This is considerably later than the two months following receipt of the final audit report required by the IFAPP. No documentation was provided that authorized an extension of the submission date. Actions required, responsibilities, completion dates, and tracking methods, were listed, as required, for each of the 22 recommendations and the recommendation on licence extension. An audit action plan status report was prepared and submitted on July 27, 2007 (somewhat later than the required submission date of May 9, 2007) and approved on July 31, 2007.

Recommendation 8: District MNR and OVFI must ensure that submission of audit action plans and status reports meet due date requirements as assigned in the IFAPP or document the rationale for a change in the due date.

Table 6 summarizes the audit team's assessment of the effectiveness of the actions in addressing the 1998-03 audit recommendations.

Table 6. Audit team assessment of achievement of the 2003 IFA recommendations.

Recommendation from the 2003 Ottawa Valley Forest IFA		Summary of Progress	Assessment
1	OVFI should adopt a more formal approach to implementation of its policies, including a more auditable and visible connection between the policies and the procedures.	OVFI current documented Forest Policy is dated April 7, 2008. It contains Vision and Mission statements and a set of principles that provides guidance to staff and shareholders.	Completed.
2	The MNR and OVFI should work jointly with local Aboriginal communities and operators to provide them with more forest-based opportunities, especially including additional harvest allocations. This effort should be a high priority.	Representative of four Aboriginal communities participated on 2006-11 FMP planning team. The Algonquins of Pikwakanagan currently receive 2.3% of the AHA as per Appendix F of the SFL. The AHA for the 2006-11 FMP has decreased from previous plans, and was 100% allocated in previous plans to OVFI shareholders. Opportunities for subcontracts under existing licensees allocations offered, none accepted by Aboriginal communities at time of audit. Algonquin communities participating in land claim negotiations with the provincial and federal governments with potential future implications on access to natural resources.	Completed.
3	Corporate MNR should ensure that the Forest Information Manual information delivery deadlines for plan production are met.	An outdated FRI remains a key issue on the Forest; Planning for the 2011-21 FMP will not have a current inventory.	Incomplete See Recommendation 2
4	Corporate MNR should ensure that the information provided to the Planning Team for Table FMP-5 in the 2006 FMP is accurate.	FMP-5 was revised for the 2006-11 FMP and included an explanation for apparent unusual numbers; approach has changed with the 2004 FMPM requirements making Table FMP-5 obsolete.	Completed
5	Corporate MNR should fulfill its obligation to adequately fund the collection of values information.	MNR provided significantly more money for values collection for the 2006-11 FMP.	Completed
6	The Company should make greater efforts to ensure that tree markers are on site sufficiently prior to the scheduled commencement of operations so that the discovery of values will not impinge on operations.	This was not raised as an issue during the audit term. Tree markers were effective at identifying un-mapped values and implemented the proper prescriptions.	Completed
7	The Company and MNR should require the overlapping licensees to conduct more accurate pre - planning.	This was not raised as an issue during the audit term until a comment was received by the District Manager after review of the draft audit report. The manager for the SFL agrees more work could be done in the field but MNR might want to revisit its approval process over access plans.	Ongoing
8	The Company and MNR should agree upon the types of situations which require AWS revisions.	Updates to the planning process and regular OVFI/MNR communications are addressing the issue.	Completed
9	MNR should commit to an expeditious process for reviewing and approving AWS revisions.	Addressed through changes to review procedures.	Completed

Continued on next page.

Table 6 continued.

Recommendation from the 2003 Ottawa Valley Forest IFA		Summary of Progress	Assessment
10	Regional and District MNR and the Company should work towards developing a revised approach to deer yard management to take effect in the 2006 plan term. MNR Regional input should ensure consistency with approaches taken throughout the Southcentral Region.	A revised approach to deer yard management was developed for the 2006-11 FMP based on a set of habitat criteria and an analysis of suitable deer habitat on the Forest. Deer yard management now focuses on four yards.	Completed
11	Regional MNR and Company staff should review the suggested monitoring procedures for the exceptions proposed in the 2001 FMP to try to improve their feasibility while retaining their scientific validity.	MNR Science and Technology Unit was somewhat involved with OVFI in looking at the monitoring of exceptions, and the result was adequate.	Exceptions removed from FMP making recommendation redundant.
12	The MNR and OVFI should continue efforts to develop memoranda of understanding clarifying maintenance responsibilities for all continually passable roads and associated water crossings. For new roads and water crossings, such memoranda should be developed prior to road construction.	Completion of action 1 reflects direction arising from the work of the Industry/MNR Task Team on roads and water crossing. The inventory of roads and water crossings is underway and will take some time to complete.	Action 1 Completed Action 2 – progress being made towards preparation of 2011-21 FMP
13	The MNR and the Company should meet at least once a year to review implementation of the Guidelines for Closing and Abandoning Forest Access Roads within the Madawaska Highlands LUP area.	Separate meeting held in March 2006. No specific documentation of discussions at FIM/Ops meetings. Planned annual activities were described in AWSs and actual activities summarized in ARs and FOIP reports.	Completed
14	Staff from OVFI, its shareholder organizations and MNR should jointly calibrate their perceptions of non-compliances to make for consistent reporting.	There remain significant issues with the compliance program.	Issues remain See Recommendation 7
15	MNR and OVFI should request that the Regional DM and GM Committee, with input from MNR Main Office, review and consider ways to improve the compliance monitoring situation on the Ottawa Valley Forest, including in particular the appointment of a regional compliance advisor.	The request was made and there is a regional position established to follow up on this issue but there is not a regional compliance advisor.	Issues remain See Recommendation 7
16	Regional MNR should organize a regional compliance workshop to bring together compliance staff from Southern Ontario SFL companies and District Offices.	A compliance workshop was held on December, 2005 but a regional compliance workshop was not held.	Ongoing See Recommendation 7

Continued on next page.

Table 6 continued.

Recommendation from the 2003 Ottawa Valley Forest IFA		Summary of Progress	Assessment
17	Corporate and District MNR should examine their compliance data systems to determine the reasons for the discrepancies appearing in the data, and develop a methodology to reduce the differences.	The FOIP system is web based and hence the data is on a single server eliminating the problems of data consistency.	Completed
18	For the 2006 FMP, OVFI should implement its intention to carefully review the post-harvest inspection and treatment regime, and regeneration lag times, on pine shelterwood sites.	The regeneration lag times for naturally and artificially regenerated white pine were extended. However, there continues to be controversy between local MNR and OVFI with respect to the post-harvest inspection and treatment regime on pine shelterwood, as well as other sites. On going review is merited.	Partially completed
19	OVFI and MNR should jointly devise a format for the Company to use to assess and report on the silvicultural efforts and accomplishments on class X, Y, and Z lands.	The X, Y, Z lands exercise was successful. A thorough joint report was prepared by OVFI and MNR.	Completed
20	OVFI shareholders should make good on their outstanding Crown charges and ensure that future Crown charges are paid in timely manner.	Shareholders who are also overlapping licensees were notified in writing of their responsibility to pay Crown charges and that they must keep payments current. One shareholder had an insignificant outstanding balance owing to the Minister of Finance for Crown charges as of March 31, 2008.	Completed
21	The OVFI should ensure that the Forest Renewal Trust Account holds the required minimum balance on March 31 of every year.	Renewal rates were increased with the implementation of the 2006-11 FMP. Company reviews and updates account activities at its annual budget-setting exercise. The minimum balance was maintained on March 31 of every year.	Completed
22	OVFI and MNR should review the SFL conditions in Appendix F to ensure that they remain worthwhile and determine appropriate guidelines for assessing compliance. The two parties should also review and agree on a method of assessing compliance with the SFL Appendix E condition.	Review conducted and revisions to Appendix F and associated compliance assessment method agreed to.	Actions completed; Appendix F conditions in SFL yet to be revised.

Continued on next page.

Table 6 continued.

Recommendation from the 2003 Ottawa Valley Forest IFA		Summary of Progress	Assessment
23	The Audit Team believes that management of the Ottawa Valley Forest was in substantial compliance with the laws, licences and Timber and Forest Management Plans in effect during the audit period. Management was also consistent with the principles of Sustainable Forest Management. The Audit Team recommends extension of the Sustainable Forest Licence for the Ottawa Valley Forest.	MNR extended the term of the SFL in June 2006.	Completed

Forest Renewal Trust

In Ontario, forest resource licence holders are required to make payments into the Forest Renewal Trust based on assessed forest renewal charges. The Trust provides for long term, sustainable funding of eligible silviculture work for Crown forests that were harvested. Each cubic metre of wood harvested on Crown lands in the Province is subject to this renewal charge and a minimum balance, specific to each forest, must be maintained in the Trust Account. The minimum balance requirement of $1,124,700 was met on March 31 in all years of the audit term. MNR made a deposit to the account, referred to as an MNR Deferral Offset Payment, of approximately $12,000 on March 31, 2008, although the account was approximately $488,000 above the minimum balance requirement at that time. MNR Deferral Offset Payments are now occurring on other Crown forests in Ontario in amounts substantially larger than on the Ottawa Valley Forest. The audit team requested information on the reason for MNR's contribution. MNR responded that the deposit was made to cover stumpage payments that were in arrears and ensure that unpaid Crown charges would not negatively affect the ability of SFLs to conduct renewal activities. In this case the stumpage was owed by three overlapping licence holders, the majority of money being owed by a non-shareholder licensee. MNR further stated that their deposit does not relieve licensees of their obligation to pay stumpage owing. OVFI management and MNR Pembroke District were unaware of the deferral offset payments to the account.

Most of the money owing on the Ottawa Valley Forest has been owed for more than four years and to date less than 2% of the outstanding amount has been collected and returned to the Ministry of Finance, indicating that the debt may be difficult to collect. The audit team believes that, while MNR's actions were well-intentioned, the deferral offset payments undermine the Forest Renewal Trust principle that companies benefiting from the right to harvest timber on Crown lands pay for that benefit in part by covering the costs of renewal of harvested areas. The audit team strongly suggests that MNR revise its approach to collection of Crown dues to ensure that the renewal portion of stumpage is secured in advance, perhaps through requiring individual licensees to put up a bond, based on the annual approved harvest level for each licensee, which covers the projected amounts owing.

Silvicultural Standards

KBM sampled approximately 20% of activities associated with the Forest Renewal Trust Account Specified Procedures Review for 2006-07 and verified that maps and other records were appropriately maintained and were consistent with the field work viewed.

The 2003 IFA recommended that OVFI and MNR jointly devise a format for the Company to use to assess and report on the silvicultural efforts and accomplishments on class X, Y, and Z lands. This process addresses the need to ensure that harvested areas categorized as X, Y and Z lands meet silviculture standards and their regeneration status is known. The audit team was impressed by the cooperative

effort of OVFI and MNR Pembroke staff to address the outstanding X, Y, Z lands, including the associated joint report. In response to the recommendation the Company staff and MNR staff began to meet in 2004 and a system for completing the work was agreed on. The maps detailing the X, Y, Z lands that were signed by MNR and OVFI in 1999 were reviewed using Ottawa Valley Forest's GIS spatial silviculture data and historical silviculture information to determine what activities had occurred on the areas. The status of each stand (or polygon) was designated as either pending, accomplished, or removed. The X lands were not reviewed as they were already under the SFL's management with regards to assessment scheduling and update requirements, and were captured accurately in spatial coverages produced and maintained by OVFI. Data from the exercise was well laid out in spreadsheet format, identifying each polygon as Y or Z land, tagging it with an identifying number, giving its location, status of treatments and rational for giving it that status.

The status of the Y and Z lands (areas harvested prior to 1995) as of February 2007 was:

- Pending - 22.1%
- Accomplished or Removed - 73.5%
- Part Accomplished or part Pending - 4.4%

Aboriginal Opportunities

Section 20.1 of the SFL requires that OVFI work co-operatively with MNR and local Aboriginal communities in order to *identify and implement ways of achieving a more equal participation by Aboriginal communities in the benefits provided through forest management planning.* As per Appendix F of the SFL, 2.3% of the available harvest area to a maximum of 500 ha is to be made available through an overlapping license to the Algonquins of Pikwakanagan during the five year term of each forest management plan. Under the 2001-06 FMP, the Algonquins of Pikwakanagan were allocated (through Makwa Economic Development Corporation Inc.) 499 ha, or 2.46% of the AHA. Under the 2006-11 FMP, they have been allocated 385 ha, or 2.24% of the AHA. The Algonquins of Pikwakanagan have a significant forestry operation on the neighbouring Algonquin Park Forest where a majority of their resources are committed each year. In light of on-going land claim negotiations, the Algonquins of Pikwakanagan have chosen to remain an associate member of the SFL for several years now but has assumed all the financial and operational responsibilities and opportunities of a harvest shareholder.

Two shareholders of OVFI offered a total of 350 ha of forest for contract harvesting and renewal and tending work to the Algonquin communities. The offer was not accepted for a variety of reasons. The amount did not meet the expectations of some nor was it offered as an independent allocation, and concerns were raised by others regarding the potential quality of the wood. OVFI indicated during the site visit that this remains a standing offer.

Due to the decline in the AHA in the current five year period compared to the previous five year period, and a further decline anticipated over the next plan period, and the fact that the AHA is fully allocated, it is not possible to license more area to one or more Algonquin communities without taking area away from existing shareholders and licensees. This is an option OVFI and MNR are not willing to pursue at this time. This issue was discussed in more detail in Section 3.2.5.

OVFI has also supported the Algonquin communities through other means as follows:

- OVFI shareholders regularly hire local Aboriginal contractors to harvest portions of their overlapping licences
- The company has hired community representatives to accompany OVFI staff in the field to view and authenticate or dismiss high potential cultural heritage sites
- OVFI has provided monetary and technical support to the Algonquins of Pikwakanagan's Earthwalkers program, a stewardship program within the community and Renfrew County designed to provide work experience to youth in the natural resources sector

- OVFI hired the R.P.F. employed by the Algonquins of Pikwakanagan economic development office (Makwa Community Development Corporation Inc.) to review potential allocation blocks and prepare FOPs
- Stand improvement work is regularly contracted to an Aboriginal contractor

The number of Aboriginal people working in the forest industry in any capacity is not officially tracked. Therefore, it is unclear just how many Aboriginal people are actually engaged in forest management activities and related processing operations on the Ottawa Valley Forest. As the number of people being determined through their communities to be Algonquin, that has the potential to increase the number of Aboriginal people employed in the forest sector on the Ottawa Valley Forest.

Compliance Planning and Monitoring

The Company fulfilled its obligations to develop compliance plans and implement a monitoring program. The plans provide considerable direction to a monitoring program that is implemented in a manner that is producing good results notwithstanding the controversy described in Section 3.6.1.

Forestry Operations on Mining Claims

There were no concerns regarding operations on mining claims on the Ottawa Valley Forest. A review of MNR records indicates that mining claim holders were notified of proposed forest management activities on or near claim areas upon approval of each AWS.

3.8.2 Concluding Recommendation

Recommendation 9: The audit team concludes that management of the Ottawa Valley Forest was generally in compliance with the legislation, regulations and policies that were in effect during the term covered by the audit, and the Forest was managed in compliance with the terms and conditions of the Sustainable Forest Licence held by Ottawa Valley Forest Inc. Forest sustainability is being achieved, as assessed through the Independent Forest Audit Process and Protocol. The audit team recommends the Minister extend the term of Sustainable Forest Licence 542529 for a further five years.

4.0 SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

The audit team concludes that management of the Ottawa Valley Forest was generally in compliance with the legislation, regulations and policies that were in effect during the term covered by the audit, and the Forest was managed in compliance with the terms and conditions of the Sustainable Forest Licence held by Ottawa Valley Forest Inc. Forest sustainability is being achieved, as assessed through the Independent Forest Audit Process and Protocol.

Table 7 is a summary of the recommendations directed towards OVFI and/or MNR Pembroke District. Table 8 provides a summary of the recommendations directed towards Corporate MNR and/or Southern Region MNR.

Table 7. Summary of recommendations and best practices directed towards OVFI and/or District MNR.

Principle 1: Commitment
None
Principle 2: Public Consultation and Aboriginal Involvement
Recommendation 1: District MNR must ensure that the LCAC Terms of Reference is updated to meet the requirements of the 2004 FMPM.
Principle 3: Forest Management Planning
Best Practice: The Analysis Documentation of modeling inputs and rationale for specific inputs was excellent in its completeness, discussion of analysis and decisions, and general readability of a technical component of the forest management plan.
Principle 4: Plan Assessment and Implementation
Recommendation 4: OVFI must consider additional attention to road construction standards and techniques to reduce runoff and improve cross drainage as part of its compliance program.
Principle 5: System Support
None
Principle 6: Monitoring
None
Principle 7: Achievement of Management Objectives and Forest Sustainability
None
Principle 8: Contractual Obligations
Recommendation 8: District MNR and OVFI must ensure that submission of audit action plans and status reports meet due date requirements as assigned in the IFAPP or document the rationale for a change in the due date.
Recommendation 9: The audit team concludes that management of the Ottawa Valley Forest was generally in compliance with the legislation, regulations and policies that were in effect during the term covered by the audit, and the Forest was managed in compliance with the terms and conditions of the Sustainable Forest Licence held by Ottawa Valley Forest Inc. Forest sustainability is being achieved, as assessed through the Independent Forest Audit Process and Protocol. The audit team recommends the Minister extend the term of Sustainable Forest Licence 542529 for a further five years.

Table 8. Summary of recommendations directed towards Regional and/or Corporate MNR.

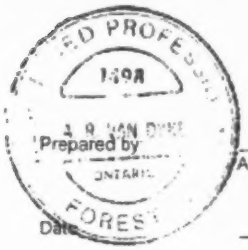
Principle 1: Commitment
None
Principle 2: Public Consultation and Aboriginal Involvement
None
Principle 3: Forest Management Planning
Recommendation 2: Corporate MNR must review the FRI and FMP cycles to ensure they are properly synchronized to meet the planning needs of OVFI and Pembroke District MNR.
Recommendation 3: Corporate MNR must review the use of contingency areas and NDPEG and either update the FMPM or the NDPEG such that the use of contingency area is more clearly defined and consistent in both documents.
Principle 4: Plan Assessment and Implementation
None
Principle 5: System Support
Recommendation 5: Corporate MNR must review the funding formula for SFL administration at the provincial level to ensure the correct balance of private and public funding as well as in-kind support is being provided to SFL holders to properly administer the forest management program on behalf of the Crown.
Recommendation 6: Corporate MNR must review its document control process for its website postings.
Principle 6: Monitoring
Recommendation 7: MNR Region and/or Corporate MNR must take steps to resolve the long standing controversy over the implementation of the compliance program in the Pembroke District.
Principle 7: Achievement of Management Objectives and Forest Sustainability
None
Principle 8: Contractual Obligations
None

APPENDIX A – COMPARISON AND TREND ANALYSIS OF PLANNED VS. ACTUAL FOREST OPERATIONS REPORT

COMPARISON AND TREND ANALYSIS
OF
PLANNED OPERATIONS VS. ACTUAL OPERATIONS REPORT

OTTAWA VALLEY FOREST
(Management Unit 780)
for the period
April 1,2003 to March 31, 2008

This report has been prepared in fulfilment of the requirements of Appendix 'C" of the Ontario Ministry of Natural Resources Independent Forest Audit Protocol.



Prepared by: A. Van Dyke
Alf Van Dyke R.P.F., Planning Forester, Ottawa Valley Forest Inc.

Date: August 05, 2008

Submitted by: J.W. Leavey
Jeff Leavey, General Manager, Ottawa Valley Forest Inc.

Date: August, 5, 2008

Introduction

The *Comparison and Trend Analysis of Planned vs. Actual Forest Operations* is prepared in support of the Independent Forest Audit (IFA) Process. This analysis highlights important trends in the management of the Ottawa Valley Forest that have emerged during the period of April 1, 1990 to the present day. This report has been prepared in accordance with Appendix C of the *Ontario Ministry of Natural Resources Independent Forest Audit Protocol* (IFAP, 2008). Although not required by the IFAP, the additional term from 1990-1996 has been included in this report to cover three full terms of actual operations and 20 years of planned. To simplify organisation of this report all of the required tables and associated figures are placed in order at the end of the document.

The boundaries of the Ottawa Valley Forest coincide with the municipal boundaries of Renfrew County. The boundaries are also coincident with the boundaries of the Ministry of Natural Resources Pembroke District. Regionally, the Ottawa Valley Forest is located in the Ministry of Natural Resources Southern administrative region.

While the whole of Renfrew County is considered to be the management unit, the context for forest management planning, and for the IFA, are the Crown lands within Renfrew County that are managed for forestry purposes. Crown lands in provincial parks; conservation reserves and some other special designations exclude forest management and are not considered by the IFA; however, these lands do contribute to important non-timber objectives for Crown forests.

The period covered by this report (April 1, 1990 to March 31, 2008) covers a total of seven forest management plans and the evolution from two Crown Management Units (CMU) to a single amalgamated management unit under a Sustainable Forest License. Figure 1 summarises the transitions of the management unit, the timelines and responsibility for the relevant forest management plans and significant events relating to land base changes and the maintenance of the Forest Resources Inventory (FRI).

Figure 1. Forest Management Planning in the Ottawa Valley Forest 1990 to present.

TMP/FMP Term	**1990-1995 Timber Management Plan (TMP)**					**1995-1996 Contingency (TMP)**	**1996-2001 Forest Management Plan (FMP)**					**2001-2006 Forest Management Plan (FMP)**					**2006-2011 Forest Management Plan (FMP)**	
Prepared By	**OMNR**					**OMNR**	**OMNR**					**OVFI (SFL)**					**OVFI (SFL)**	
	1990-1991	1991-1992	1992-1993	1993-1994	1994-1995	1995-1996	1996-1997	1997-1998	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008
MU *(Responsibility)*	***Bonnechere Crown Management Unit*** *(Pembroke District MNR)*						***Pembroke Crown Management Unit*** *(Pembroke District MNR)*		SFL Transition	***Ottawa Valley Forest*** *(Ottawa Valley Forest Inc., SFL)*								
	Madawaska Crown Management Unit *(Pembroke District MNR)*																	
Manual	Prepared in accordance with the Timber Management Planning Manual for Crown Lands in Ontario (TMPM, 1986) A one-year contingency plan was prepared in order to adjust plan renewal dates across the MNR Southern Region.						Prepared in accordance with the TMPM, subject to the phase-in requirements of Appendix VIII of the Forest Management Planning Manual fo Ontario's Crown Forests (FMPM, 1996)					Prepared in accordance with the full requirements of the FMPM (1996).					Prepared in accordance the FMPM (1996), subject to phase-in provisions of the FMPM (2004). AWS and AR requirements are in accordance with FMPM (2004).	
FRI	1976 photography, 1979 FRI, township-based mapping. 1988, 'grown' to 1990. Partial update using OPC data collected since 1983. Clearcut depletions since 1979 updated to B&S. First 'Forest Units' described (27).						New inventory, based on 1987 photography (1:15,840), switch to OBM base mapping (1:10,000), 'grown' to 1996. Some updates from OPC data and inspections. Unclear on updates of depletions and FTG. Forest units aggregated, decreased from 27 to 12.					1988 inventory is digitised. Extensive survey and update of past depletions. Still extensive B&S in inventory. 'Grown' to 2001 in SFMMTool. Forest Units (15) essentially redefined to meet requirements of FMPM, SFMM, Silvicultural Guides.					Still using the digitised version of the 1988 FRI. Updated for accruals and depletions in 2003. Because of concerns for over estimation of stocking, height, and site class it was decided not to 'grow' the inventory (except for age) beyond the 1996 position.	
Land Base	Essentially unchanged over most of ths period. Minor withdrawals occurred in the 1990's with the development of ANSI's, and Madawaska Highlands Land Use Plan.									*Ontario's Living Legacy Land Use Strategy (1999)* identifies almost 12,000 hectares of protected areas, no longer available for forest management.						No signifcant landbase changes since OLL. Scattered minor tenure corrections and OLL boundary adjustments have occurred. As of April 1, 2008 only the Deacon Escarpment Conservation Reserve and the Upper Ottawa River Provincial Park remain to be regulated.	

Summary of Total Area Under Management (Table 1)

Table 1 provides a summary of the total area available for forest management on the management unit during each of the relevant planning periods. The table provides a break down by forested and non-forested land classes. Production forest areas are further broken down into the standard FRI working groups and "Barren and Scattered" classes.

The source of information for 1990-1995 and 1995-96 was Table 10 of the Bonnechere Crown Management Unit (BCMU) Timber Management Plan (TMP), and Table 11 of the TMP for the Madawaska Crown Management Unit (MCMU). Information for the 1996-2001 term was compiled from table 4.8.1 of the 1996-2001 TMP for the Pembroke Crown Management Unit (PCMU). The source of information for the 2001-2006 and 2006-2011 terms was tables FMP-1 and FMP- 2 from the respective FMPs for Ottawa Valley Forest.

1990-1996 vs. 1996-2001 Inventory

Table 1 shows an overall decrease of 4,063 hectares in the Managed land base between the 1990-1996 TMPs and the 1996-2001 FMP. The 1996-2001 FMP offers no explanation for this discrepancy. Possible explanations are corrections to ownership; finer delineation of smaller waterbodies (water increased 2,000 ha) and issues associated with the conversion to the 1:10,000 scale base mapping. In terms of land use policy, the area in parks remained essentially the same during both these periods, and there are no other land use withdrawals identified in the 1996-2001 FMP land base summary. *(Areas of Natural and Scientific Interest (ANSI) and candidate ANSIs were proposed and implemented during this period but do not appear as withdrawals in the land base summaries.)*

Other significant observations of the 1988 re-inventory and 1996 update are:

1. The non-productive forest was increased by almost 7,000 hectares between these two planning periods.
2. The protection forest classification was reduced by almost 11,000 hectares. The decrease in protection forest was noted as an issue by the 1996-2001 plan authors and adjustments were made in the determination of Maximum Allowable Depletion (MAD) land base to compensate for the potential underestimation of protection forest in the 1996-2001 inventory.
3. The Barren and Scattered (B&S) lands were reduced by almost 11,000 hectares.
4. Inconsistent with the overall land base reduction, the total area in production forest increased by almost 1,200 hectares.

1996-2001 vs. 2001-2006 Inventory

The 2001-2006 planning inventory was the first digital inventory for the Ottawa Valley Forest. It was created by digitising the 1988 inventory maps and incorporating the results of extensive surveys to update past depletions. Extensive B&S lands remained in the inventory due to the lack of Free-to-Grow (FTG) results. In the 2001-2006 inventory 236,259 hectares was considered to be Managed. This represents an overall reduction of 14,335 hectares. The largest portion of this is attributed to an increase of 1,444 hectares in recently regulated Provincial Parks and an additional 11,796 hectares designated as Unmanaged. These Unmanaged lands were comprised of new parks and conservation reserves proposed by *Ontario's Living Legacy Land Use Strategy*, and the core areas of the Griffith Uplands and Centennial Lake Areas of Natural and Scientific Interest (ANSI). The remaining difference is attributed to ownership corrections and minor discrepancies resulting from the conversion to the digital inventory.

Other significant differences between the 1996-2001 and the 2001-2006 planning inventories are:

1. Non-Forest lands decreased by 1,096 hectares from 4,850 hectares to 3,754 hectares (*including approximately 320 hectares classified as Unsurveyed in FMP-1, which are primarily barren islands*).

2. Non-Productive Forest lands decreased by 6,625 hectares from 26,187 hectares to 19,562 hectares. The change in both Non-Forest and Non-Productive Forest lands are out of proportion to the overall reduction in the Managed land base (23-25% decrease compared to 6% decrease overall).
3. Conversely, the total Production Forest reduction is less than the overall reduction to the Managed land base (3% decrease compared to 6% decrease overall). This can be attributed in part to the nature of the land that has been set aside for protection (e.g. Bisset Creek and Grant's Creek proposed parks have significant wetland areas associated, Deacon Escarpment has significant rock and wetland areas). A further explanation for these discrepancies may be that some Non-Forest boundaries have been changed by the GIS process that created them (e.g. road buffers). The other probable cause is in digitising and coding errors that have dissolved some Non-Forest and Non-Productive Forest into the Productive Forest stands. These errors were noted by OVFI while using the inventory in the planning and implementation of the 2001-2006 FMP. These errors will continue to be discovered and corrected over time by working with the inventory.
4. B&S lands increased to 14,419 hectares (166% increase) due to the update of 1996-2001 depletions and the lack of FTG survey results.

2001-2006 vs. 2006-2011 Inventory

A second update of the digital FRI occurred in the fall of 2003. In accordance with the requirements of the *Forest Information Manual* (FIM) the FRI Stewardship Inventory was updated with actual accruals (areas regenerated and Free-to-Grow) and depletions for the 1996-2001 period.

Other updates included:

- Corrections to ownership including the latest version (at the time) of the boundaries for parks and protected areas according to the *Ontario Living Legacy Land Use Strategy* (OLL) and the *Crown Land Use Planning Atlas* (CLUPA); and
- Replacement of the original FRI water polygons (lakes, ponds, two-sided rivers) with the Ontario Base Mapping (OBM) water polygons, which are more up-to-date and more accurately geo-referenced. OBM wetlands were not included in the update due to concerns over accuracy and the difficulties it would create to reconcile with existing non-productive forest polygons in the FRI.

To facilitate the development of the 2006-2011 FMP the Stewardship Inventory was updated with actual depletions and accruals from the first three years of the 2001-2006 FMP term and with forecast depletions to the end of the term to create the Planning Inventory.

The Planning Inventory was aged to the year 2006 but again was not grown (i.e. did not alter stocking and height) due to concerns for over estimating stocking, height and site class. The Planning Inventory was also created in the new FRI architecture in accordance with the *Forest Information Manual Technical Specifications for Providing Stewardship and Planning Inventory Information* (October 2003).

Managed Crown lands actually increased by 1,154 hectares to 237,413 hectares in the 2006-2011 Planning Inventory primarily due to refinement of the preliminary OLL boundaries. Barren and Scattered/Depleted area was reduced from 14,419 hectares in 2001 to 11,599 hectares in 2006. This is a conservative estimate of the reduction as it includes forecasted depletions to 2006 but does not include any potential accruals after 2003.

Summary of Table 1 Trends

Ontario's Living Legacy Land Use Strategy has had the greatest impact on the area available for forest management in the Ottawa Valley Forest since 1990. Wood supply projections from both the 2001-2006 and the 2006-2011 FMPs, predict that future wood supply will not be sufficient to meet projected industrial demand for some species and products. Further land base reductions would only exacerbate the future wood supply situation.

Description of Forest Units (Table 2)

Table 2 summarises the forest unit descriptions and criteria used to assign forest stands to forest units based on FRI stand descriptions for each of the plan terms covered by this report. The source for this information is Appendix 14 of the 1990-1995 TMP, Appendix F of the 1996-2001 TMP, and table FMP-8 of both the 2001-2006 and 2006-2011 FMPs.

1990-1996

The concept of forest units was first introduced to the Ottawa Valley Forest in the 1990-1995 TMPs. The definition of forest unit according to the TMPM was much broader than the current definition under the FMPM (1996/2004). In part, "an aggregation of stands, including potential forest areas assigned to this category, and managed under the same rotation and broad silvicultural system." Under this definition, 27 forest units were created to describe the forest and address perceived management issues relating to silviculture and timber production. These forest units were carried through into the 1995-1996 Contingency TMPs.

Forest units occurring on site class 4 were not available for harvest (not shown in Table 2), leaving 19 forest units in the production forest. Some comments on the forest units of this period are:

1. Definitions were very fine, probably well beyond the accuracy of the FRI data.
2. A Maximum Allowable Depletion (MAD) determination was not carried out for all forest units; minor forest units were "allocated as encountered".
3. Some forest units were combined in the determination of MAD and for the purposes of allocation.
4. Forest units were allocated above the level of the MAD.

1996-2001

In the 1996-2001 TMP it was recognised that the forest unit definitions of the previous plan were too fine and "perceived differences in applied silvicultural systems between forest units did not materialise." This allowed more forest stands to be aggregated into fewer forest units. As can be seen in Table 2 the criteria for assigning forest units were more or less distilled from the 1990-1995 TMPs and resulted in only 12 forest units. The similarities allow the connection to be followed between the two planning periods.

Some inconsistencies in the application of forest units persisted in the 1996-2001 TMP:

1. MAD was not determined for all forest units; minor forest units were "allocated as encountered".
2. Forest units were allocated above the level of the MAD.

2001-2006 and 2006-2011

The 2001-2006 and 2006-2011 FMPs for Ottawa Valley Forest were prepared in accordance with the FMPM (1996), which required plans to consider objectives for timber production, forest diversity, other values dependent on the forest and silviculture. The approach is based on modelling the development of the forest over a very long time frame under different management alternatives and then selecting the management alternative that best meets the multiple objectives of the plan. The non-spatial Strategic Forest Management Model (SFMM), supported by spatial models for forest diversity and wildlife habitat, were the tools employed in this analysis. To adequately meet the requirements of this complex process, forest units were needed to describe and quantify objectives and outcomes for forest diversity, other values dependent on the forest, timber production and silviculture. The planning team used the following principles to determine the forest units and to develop the criteria to assign forest stands to appropriate forest units:

1. Forest units should relate to plan objectives in one or all of the four categories prescribed by the CFSA.
2. Forest units should have an ecological basis, which would inherently relate to an appropriate silvicultural system and harvest method. Growth and yield was also a consideration.
3. FMP objectives were considered to extract highest priority forest units first. The criteria are applied from the top of Table 2 to the bottom (without replacement). Forest Units of higher priority are filtered out first. These may include forest units such as HE1 (hemlock) or PJ1 (jack pine) defined to meet ecological as well as timber production objectives in the FMP.
4. Compared to the TMPM, the FMPM prescribes much tighter rules on the relationship of forest units to the silvicultural ground rules, the determination of Available Harvest Area (AHA) and the allocation of forest units. Criteria should reflect practices and management standards prescribed by the *Silvicultural Guide for the Great Lakes St. Lawrence Conifer Forest* and the *Silvicultural Guide for the Tolerant Hardwood Forest in Ontario*. For example, stocking and composition standards are used to distinguish between four-cut uniform shelterwood, two-cut uniform shelterwood and clearcut with seed trees.
5. Number of forest units should be balanced with ability to allocate them subject to numerous, often conflicting objectives such as creating reasonable harvest blocks, while meeting landscape diversity and wildlife habitat constraints.

A total of 15 forest units were developed for the 2001-2006 FMP as detailed in Table 2. Many forest units of the 2001-2006/2006-2011 FMPs do not relate well to the forest units of the previous plans because of the differences in the rationale and the selection criteria. This has implications for continuity of the records, particularly as it relates to monitoring forest composition over the long term, and monitoring harvest and regeneration success.

Note: during the 1990-2001 period all activities (harvest and renewal) were reported on PLANNED forest unit (the forest unit based on the FRI data and shown in the TMP) and not on ACTUAL forest unit as found on the ground and confirmed in a Forest Operations Prescription. This compounds the problem of connecting past harvest to future regeneration success because depletion reports imply a silvicultural history that is often inconsistent with what is reported from regeneration assessments. As of the 2001 FMP all reports are based on actual vs. planned forest unit.

Summary of Planned and Actual Harvest Volumes (Table 3)

Table 3 (and associated figure) is a summary of the annualised planned and annualised actual harvest volumes for the 1990-1996, 1996-2001, and 2001-2006 periods, and also shows the annualised planned harvest volume for the 2006-2011 period.

The planned and actual harvest volumes for 1990-1995, 1995-1996 terms were compiled from the four table RPFO-4s in the Report of Past Forest Operations (RPFO) for the Bonnechere and Madawaska Crown Management Units (1990-1996). Planned and actual volumes for the 1996-2001 term are taken from table RPFO-4 of the 1996-2001 RPFO for the Ottawa Valley Forest. Planned and actual volumes

for the 2001-2006 term are taken from table AR-4 of the 2005-2006 (fifth year) annual report for the Ottawa Valley Forest. Planned volume for the 2006-2011 term is taken from Table FMP-21 of the 2006-2011 FMP.

Planned Harvest Volume

Annualised planned harvest volumes increased 6% from 333,121 cubic metres/ year in the 1990-1996 period to 354,524 cubic metres/year in 1996-2001 even though the average annual planned harvest area decreased by over 20% over the same period. Average planned yield was 60 m^3/ha in the 1990-1996 period and 81 m3/ha in 1996-2001. The method of determining harvest volume was similar in both planning terms (averaged stand characteristics by forest unit). The difference in planned yield is attributed to variances in the nature of the allocations and due to changes in assumptions based on improving utilisation. Detailed calculations are not provided in the documentation of the 1990-1996 TMPs, but are available in Appendix 1 of the 1996-2001 FMP.

Compared to 1996-2001, annualised planned harvest volume decreased 17% in the 2001-2006 FMP to 293,800 cubic metres/year, on a reduction of only 7% in planned harvest area. Average planned yield decreased to 73 m^3/ha. The overall reduction in planned harvest volume can be attributed in part to the land base reduction; however, the difference in average yield is primarily attributed to:

1. Lower proportion of clearcut to shelterwood and selection harvesting when compared to the 1996-2001 FMP, which in turn is attributed to a completely different process for determining the Available Harvest Area.
2. Different volume determination (2001-2006 FMP used SFMMTool, modified Plonski).
3. Different assumptions re: unharvested volume to meet new guidelines for retention of mast trees, cavity trees, veterans and other diversity values.

Annualised planned harvest volume decreased an additional 11% in the 2006-2011 FMP to 261,098 cubic metres, on a reduction of over 15% in planned harvest area. The Selected Management Alternative for the 2006-2011 term has a lower proportion of partial harvest including prep cuts, commercial thinning, selection and other shelterwood harvests, than in the 2001-2006 term. The result is an increase in the average projected and forecast yield.

Actual Harvest Volume

<u>1990-1996</u>

Annualised actual harvest was 233,450 m^3/yr during the 1990-1996 period. This equated to 70% actual harvest volume achievement compared to 61% actual harvest area achievement (Table 4).

1. On a species/species group basis, poplar was the volume leader at 42% of the harvest volume. Annualised actual volume of poplar was 63% of the annualised planned poplar harvest volume.

2. White pine was second to poplar at 18% of the harvest volume, and together, white and red pine comprised 27% of the harvest volume. Annualised actual white pine harvest volume achieved 93% of planned, while red pine achieved 214% of the annualised planned volume. Significant additional red pine volume was realised from renewal and tending allocations for red pine thinning (i.e. not part of harvest allocation under the rules of the day).

3. Tolerant hardwoods (all hardwoods other than poplar and white birch) comprised 19% of the total actual harvest volume. Annualised actual harvest volume for the tolerant hardwoods was 74% of the annualised planned volume.

4. White birch comprised only 6% of the actual volume harvested. The annualised actual harvest volume was only 41% of the planned volume. Poor utilisation of small diameter white birch may

be part of the reason, but other factors may be white birch decline that is relatively common across the unit, and a general tendency of the FRI to overestimate the white birch component of forest stands.

5. The minor other conifers comprised the remaining 6% of the actual volume harvested (spruce, jack pine, hemlock, balsam fir, cedar). The annualised actual harvest volume was 120% of planned for spruce (mostly white spruce) but was an average of 30% for the other species. Operational issues (e.g. wet sites for black spruce and cedar) and Area of Concern prescriptions (e.g. cedar and hemlock in deer yards) are limiting factors to utilisation of many of these species. Utilisation of small diameter conifers is also influenced by the lack of markets within economic hauling distance.

Unfortunately a product breakdown is not available from the RPFO data for 1990-1996 period.

1996-2001

Annualised actual harvest volume increased to 253,827 m^3/yr compared to the previous period, an increase of approximately 9%. This increase in harvest volume occurred on an annualised harvest area of approximately 3,300 hectares/year (Table 4), which is directly comparable to the area harvested in the previous period. The higher yield may be indicative of differences in the allocations but could also be attributed to improved utilisation. Average actual yield was slightly lower than planned (95%) at 78 m^3/ha. Annualised actual harvest volume was comparable to utilisation of the planned harvest area at 72% and 75% respectively. This is considered a good result at the management unit level.

The primary species groups continued to show considerable variation between annualised actual volume and annualised planned volume when compared to the forest as a whole.

1. Poplar remained the volume leader during 1996-2001 at 42% of the total actual harvest volume. While annualised actual harvest of poplar was up 9% from the 1990-96 period, the planned harvest volume was down considerably. This improved the relative achievement of poplar volume (actual/planned) to 98%.

2. White pine remained second to poplar during 1996-2001, down slightly to 15% of the total actual harvest volume. White and red pine combined, comprised 24% of the total actual harvest volume. Annualised actual white pine harvest volume was down to 91% of the actual volume in the 1990-1996 period, but a significant reduction in the planned volume resulted in a relative achievement of 109% (actual/planned). Annualised actual red pine volume increased by 10% from the 1990-1996 period and achieved 178% of the annualised planned volume. As in the 1990-1996 period, significant additional red pine volume was realised from the renewal and tending allocation for red pine thinning (i.e. not part of harvest allocation under the rules of the day).

3. As in 1990-1996, tolerant hardwoods comprised 19% of the total actual harvest volume. Annualised actual harvest volume for the tolerant hardwoods was up 9% from 1990-1996 yet the achievement was only 52% of the annualised planned harvest volume. The annualised actual harvest area and annualised actual volume of tolerant hardwoods harvested are very comparable between the two periods. The difference appears to be in the determination of planned volume for tolerant hardwoods. The planned average yield for tolerant hardwoods in 1996-2001 is double the planned average yield for the 1990-1996 period.

4. In 1996-2001 white birch comprised 7% of the total actual volume harvested. Annualised actual harvest of white birch was up 27%. Similar to the previous period, the annualised actual harvest volume was only 43% of the planned volume. As discussed above, the poor utilisation of small diameter white birch may be part of the reason, but other factors may be white birch decline and a tendency of the FRI to overestimate the white birch component of forest stands.

5. The annualised actual harvest of other conifers increased slightly to 8% of the total actual volume harvested, although annualised actual volume for all species except hemlock was down from the 1990-1996 period. There was no significant improvement in the utilisation of small diameter balsam fir and cedar during this period.

During 1996-2001 overall average yield was close to planned; however, the actual proportions by species and products showed significant differences. Actual average conifer log yields were significantly higher (24 m^3/ha) than planned (15 m^3/ha). Conversely, the average yield of conifer pulp was much lower than planned at 0.5 m^3/ha vs. the average planned yield of almost 10 m^3/ha.
This illustrates two trends:

1. Utilisation of at least a portion of the smaller conifer traditionally considered as pulp was on the increase due to the installation of small log lines at number of the area mills and the availability of markets for softwood residues (G.P. Flakeboard in Bancroft (now closed), Temple Inland M.D.F. plant in Pembroke). Red pine was particularly affected due to the strong demand for pressure treated products.
2. Overall, utilisation of conifer pulp (other than red pine and to some degree spruce and jack pine) continues to be a problem due to lack of markets within economic hauling distance. (Utilisation of cedar, hemlock is also be affected by Area of Concern prescriptions, particularly for deer yards).

Actual average yield of poles (primarily red pine and jack pine) was only one third of the planned yield.

On a product basis, the average actual yield of hardwood logs was significantly greater than planned (28 vs. 19 m^3/ha); however, this is primarily attributed to the proportion of poplar being utilised by sawmills. The average actual yield for hardwood pulp was much less than planned (25 vs. 35 m^3/ha), particularly for the tolerant hardwoods. Quality tolerant hardwood sawlogs and veneer were more scarce than forecast in the plan. Several trends on hardwood utilisation are indicated:

1. The addition of small log lines and accessible markets for poplar residues has increased the utilisation of poplar for sawlogs.
2. Utilisation of poor quality tolerant hardwoods is still a challenge in many allocations. While the market for hardwood pulp and fuelwood remains relatively strong, many allocations were not economical to harvest due to hauling distances. Blocks with poor access or seasonal constraints, far from markets and lacking sufficient volume of other species and products to offset the cost of harvesting are the most difficult in terms of utilisation.
3. While extensive improvement in tolerant hardwood management has occurred quality logs and veneer will continue to be in short supply in the near term.

2001-2006

Annualised actual harvest volume increased to 263,023 m^3/yr compared to the previous term, an increase of 3.5%. This increase in harvest volume occurred on an annualised actual harvest area of 3,015 hectares/year (Table 4), which is a 10% decrease from the 1996-2001 term. This total includes an insignificant volume of 1,025 m^3 from areas outside of the approved FMP (equal to 0.08% of the total regular harvest) including trespass onto Crown land by a logging operation working on adjacent private land and two small Forest Resource Licences to authorise the harvest of timber for a hydro right of way and an aggregate site.

An increased proportion of clearcut harvesting (higher yield) and a lack of progress in selection harvest (low yield) contributed to the significant difference between harvest accomplishment (74%, see Table 4) and volume utilisation (90%). Average yield of the actual harvest is 87 m^3/ha yield compared to 73 m3/ha forecast in the FMP.

1. Demand for poplar was strong through most of the 2001-2006 term, tapering off in the final year (2005-2006) as markets for most forest products started to soften with the rising Canadian dollar.

Total poplar volume harvested was 468,322 m^3, which was 36% of the total harvest volume and 94% of the planned poplar volume.

2. During the 2001-2006 FMP term 331,136 m^3 of white pine was harvested, representing 25% of the overall harvest and 106% of the five- year forecast. The actual five-year harvest volume for red pine was 157,991 m^3, equal to 151% of the five- year forecast. It has been noted that the FRI quite consistently underestimates the representation of red pine in mixed stands.

3. The five-year actual harvest volume for tolerant hardwoods is 215,125 m^3, which is 16% of the overall actual harvest and 74% of the five-year volume forecast for this species group. A significant component of this hardwood volume would be from oak shelterwood harvests and the hardwood component (red maple in particular) from mixedwood clearcuts. Tolerant hardwood volume from selection harvesting remains low due to the number of marginal selection harvests in the allocation.

4. The actual volume of white birch harvested over the five-year term was 65,723 m^3, which is 5% of the overall actual harvest volume and 64% of the five-year forecast white birch volume. This volume seems low compared to the overall level of harvest and particularly in consideration of the area of mixedwood harvest. As previously noted the decline of white birch may be a factor but whatever the reason, the consistent overestimation of birch volume in the forecast must be addressed. To compensate for this overestimation, white birch volume was reduced by 10% in all forest unit yield curves used in the development of the 2006-2011 FMP. The impact of this adjustment will be reviewed over the course of the 2006-2011 FMP.

5. The actual five-year harvest of the minor conifer species was 76,816 m^3, which is 6% of the overall harvest and only 48% of the five-year forecast. On a species basis, utilisation was 70% for jack pine, 85% for spruce (TREES does not distinguish the spruce species), 58% for hemlock, 17% for balsam fir, 26% for cedar and 4% for larch. Of greatest concern is the discrepancy in balsam fir, which for the past two plans has been significantly overestimated in the forecast. It is possible that mixed loads of balsam fir and spruce are being scaled as spruce at some destinations; but this does not come close to explaining this huge difference in volume. Poor utilisation of small diameter balsam fir can sometimes be an issue on a site by site basis, but the reported instances of wasteful practice are insufficient to account for the large difference in balsam fir volume. Overestimation of the representation of balsam fir in the FRI is considered to be the principle reason for this discrepancy. To compensate for this overestimation, balsam fir volume was reduced by 75% in all forest unit yield curves used in the development of the 2006-2011 FMP. The impact of this adjustment will be reviewed over the course of the 2006-2011 FMP.

On a product basis the actual sawlog:pulp ratio for white pine harvested during the 2001-2006 term was 91:9, which compares well with the forecast of 90:10.

The actual sawlog:pulp ratio for red pine was 96:4 compared to 100 percent sawlogs in the five-year forecast. The five-year forecast was based on the assumption that all small diameter red pine was going to be utilised by modernised small sawmill lines. In practice, minor volumes of red pine pulpwood are being shipped to area pulp and paper mills directly, and additional volume is being forwarded from sawmills such as Hokum and Freymond. This volume is being recorded against the pulp/paper/composite 'destinations' associated with these mills.

The actual sawlog:pulp ratio for poplar was 55:45 compared to 40:60 in the five-year forecast. This is indicative of the increased utilisation of poplar by sawmills, primarily for low value products such as pallet stock and dunnage. It is important to note that the poplar sawlog volume is not a graded volume and log quality can be quite variable. Some sawmills such as Gulick Forest Products have started to saw and sort for better grades of poplar suitable for higher value products such as moulding stock.

The actual veneer:sawlog:pulp ratio for white birch was 2:33:65 compared to 10:40:50 in the five-year forecast, reflecting that the white birch growing stock is generally of small diameter. White birch sawlog volume is also not a graded volume and log quality is quite variable.

The veneer:sawlog:pulp ratio for the combined other hardwoods was 0:38:61 compared to 2:28:70 forecast in the FMP. For the individual species that can be summarised from TREES, the actual ratios were 1:78:21 for yellow birch and 1:56:43 for red oak. Unfortunately data for hard maple and soft maples are combined in TREES as Maple All. Poor quality red maple makes up the largest portion of this volume which brings down the average product split for Maple All to only 26% sawlog and 74% pulp. The proportion of Grade 1 and Grade 2 tolerant hardwood sawlogs can not be determined based on the AR-4 data alone. Analysis of the raw TREES data (1999 – 2004) during the development of the 2006-2011 FMP shows the ratio of Grade 1:Grade 2 to be approximately 50:50. This TREES data was used to refine the product proportions for all species and species groupings in the 2006-2011 FMP and will continue to be used to monitor and refine these assumptions.

Summary of Planned and Actual Harvest Area (Table 4)

Table 4 (and associated figure) is a summary of the annualised planned and annualised actual harvest area for the planning terms 1990-1996, 1996-2001, 2001-2006 and 2006-2011. The actual values for 2006-2011 are based on 2006 only which was a huge year for natural depletions by a number of wind events, and consequently was a poor year for harvest accomplishment as resources were shifted to the salvage effort.

The planned and actual harvest area for the 1990-1996 period was compiled from the four RPFO-1 tables in the 1990-1996 RPFO for Bonnechere and Madawaska Crown Management Units. The planned and actual harvest area for the 1996-2001 term was taken from table RPFO-1 of the 1996-2001 RPFO for the Ottawa Valley Forest. Planned and actual harvest area for the 2001-2006 term was taken from table AR-1 of the 2005-2006 annual report (fifth-year report) for the Ottawa Valley Forest. Planned harvest area for the 2006-2011 term is taken from table FMP-18 of the 2006-2011 FMP. Actual harvest area for 2006 is taken from table AR-1 of the 2006-2007 annual report. There are no reports of natural depletion available for the 1990-96 period. Actual natural depletions for the 1996-2001 term was extrapolated from the salvage area (RPFO-1), assuming that these were the principal stand replacing depletions. Actual natural depletions for 2001-2006 and 2006 period were taken from table AR-6 of the 2005-2006 and 2006-2007 annual reports. The annualised natural depletion for the 2006-2011 is grossly overestimated as 2006 was the worst year for blowdown events in recent history. (*Note that only the blowdown events and some of the recent Armillaria root rot infections have been considered as true depletions with an associated volume, typically based on known salvage volumes. Other natural disturbances have been reported on an area basis to acknowledge that these agents are impacting the forest, but area and volume have not been depleted under the assumption that these are principally short term impacts on growth only.*)

The first trend that is immediately apparent from Tabe 4 is that planned harvest area has been decreasing steadily over the past three planning terms. Initially at 5,547 hectares/year in 1990-1996, the annualised planned harvest area decreased by over 20% to 4,357 hectares/year in the 1996-2001 FMP. The decrease cannot be attributed to any major landbase changes during this period, so it must be a consequence of differences in MAD calculations and/or allocation process. Planned Harvest Area decreased 7% between the 1996-2001 and 2001-2006 FMPs to an annualised planned harvest area of 4,052 hectares/year. This reduction can be attributed in part to a loss in land base to new parks and protected areas, but also to the new approach in forest management planning, particularly in the determination of Available Harvest Area (AHA).

The annualised planned harvest area for the 2006-2011 term is 3,423 hectares, which is only 84% of the planned harvest in the previous term. This reduction is attributed to:

a) Extending the average cutting cycle in the forest units managed under the selection system; net reduction of almost 700 hectares from the five-year planned harvest.

b) A much lower level of mid-rotation harvest (OR1 and PW1 prep cuts, PR3 commercial thinning); net reduction of almost 1,800 hectares from the five-year planned harvest.
c) Reducing the harvest of CE1 and OC1 by 50%; net reduction of 100 hectares from the five-year planned harvest.
d) The balance of the reduction is attributed to the ageing forest inventory and changes in some of the SFMM assumptions induced by the *Old Growth Policy and Old Growth Definitions*, and meeting the requirements of the NDPEG.

1990-1996

As can be seen in Table 4, annualised actual harvest area fell significantly short of annualised planned harvest area (61%). As seen in Table 3, volume achievement exceeded area achievement.
On a forest unit basis, utilisation of the pine forest units led the way with utilisation averaging close to 80% of the planned area. Utilisation of tolerant hardwood forest units managed under selection averaged only 50%. Utilisation of the even-aged hardwoods and poplar was approximately 60 %, consistent with the overall average utilisation. Utilisation of the minor forest units (spruce and cedar) was 20% or less.

1996-2001

On an area basis, annualised actual harvest area during 1996-2001 was essentially the same as in the previous period. Compared to a lower planned harvest area, the achievement improved considerably over the 1990-1996 figures. Utilisation of the planned harvest area increased to 75% overall. Trends among forest units remained the same during this period, but compared to planned harvest levels, utilisation of all forest units showed a proportionate improvement over the previous period. Pine forest units remained the leaders at 86% utilisation of the planned harvest area. Pine was followed by the even-aged hardwoods and poplar at approximately 75% utilisation. Utilisation of tolerant hardwood forest units managed under selection improved significantly in this period to 69%. The minor forest units all showed improvement to utilisation levels ranging from 40-70%.

Note: during the 1990-2001 period all activities (harvest and renewal) were reported on PLANNED forest unit and not on ACTUAL forest unit as found on the ground. As of the 2001 FMP all reports are based on actual vs. planned forest unit. This will potentially have a significant impact on reporting of harvest achievement at the forest unit level, as FRI errors may tend to show an 'artificial' increase or decrease in the utilisation of some forest units. Forest unit changes (planned to actual) are being tracked on an ongoing basis in the annual reports.

2001-2006

In absolute terms the annualised actual harvest area for the 2001-2006 term was the lowest since 1990 at 3,015 hectares. However, utilisation of the planned harvest was comparable to the previous term at 74%. A late start-up of the FMP and a severe fire season in 2001-2002, and poor market conditions in 2005-2006 were liming factors to utilisation of the planned harvest area.

Harvest progress for planned forest units was greatest for the intolerant hardwoods (INT1) and mixedwoods (MW1 and MW3) at 89% (range of 87-92%). Demand for poplar was the strongest ever experienced on the management unit up until the 2005-2006 operating year when the demand for poplar pulp tapered off. The relative strength of the poplar market compared to other species definitely resulted in a trend to favour allocations dominated by poplar, particularly in the early years of the plan term.

With the exception of the PR3 forest unit, harvest progress for the planned pine forest units (PR1, PW1, PW2) was comparable to the intolerant hardwoods and mixedwoods at 84-88%. Poor progress on the planned PR3 (plantations) was due to the large area of plantations that were not ready for thinning either because they were still too young or because they had been previously thinned and had yet to achieve sufficient stocking to require the next thinning. Harvest of pine forest units was slow at the beginning of the plan term but did improve despite a rising Canadian dollar because domestic and US housing

markets remained strong into 2004. This was short-lived however as the US housing market went into a free fall in 2005.

Harvest progress for the planned tolerant hardwood forest units was only 51% for HD1 and 70% for the OR1 forest unit. Bypass rates are similar for the HD1 and OR1 forest units but a significant area of viable HD1 was simply not cut and will be carried over into the 2006-2011 term. Market pressures are similar for hardwood sawlogs but harvesting costs per m3 are generally higher due to lower yields and difficult access. There are many stands on the unit that are under stocked due to past harvest practices and growth rates that appear to be less than predicted. This situation has been addressed in the 2006-2011 FMP by increasing the average cutting cycle for the HD1 forest unit to 40 years and reducing the predicted growth rate, which effectively reduced the Available Harvest Area for 2006-2011 by more than 700 hectares (22%). Harvest of tolerant hardwoods remains a challenge where costs of access, logging and transport potentially exceed timber values.

Utilisation is better for the OR1 forest unit because low quality is more of a factor than low yields and many OR1 dominated allocations may actually yield a significant volume of poplar and pine. The closure of the Domtar mill in Cornwall has had an impact on oak utilisation as it was an important destination for oak pulp. A lot of oak is being utilised in the commercial fuelwood market. Where applicable, stand improvement funding is being used to improve the economics of harvesting for both HD1 and OR1 allocations.

Harvest progress for the planned minor forest units was generally the poorest, averaging only 53%, and ranging from 34% to 57%. Generally these forest units represent forest types that are associated with very specific site conditions of soil type, drainage and aspect. Bypass for site conditions is a contributing factor for the low utilisation of lowland forest units (CE1, OC1 and LH1), and association with tolerant hardwood (HD1) allocations is a factor in poor utilisation of the HE1 forest unit.

In the development of the 2006-2011 FMP, the Planning Team reviewed the harvest trends for the lowland conifer forest units (CE1, OC1) and considered options to reduce the difference between planned and actual harvest. The Planning Team determined that a 50% reduction in planned harvest area would not have a negative impact on forest industry, and contributions to wildlife habitat, old growth, emulation of natural disturbance patterns etc. would be positive.

Summary of Table 4

A decrease in planned harvest area has been the trend over these three planning periods. Harvest achievement has been improving by default as planned harvest levels approach the historical actual harvest level. However, the outlook for the 2006-2011 term is not positive. Weak markets, the strong Canadian dollar, and the glut of 'extra' volume from the 2006 salvage continue to depress harvest activity.

Poplar utilisation has been steadily improving as demonstrated by both the area and volume utilisation figures. Hardwood utilisation on both a volume and area basis continues to be a challenge.

Summary of Managed Productive Forest by Forest Unit (Table 5)

Table 5 provides a detailed breakdown of the productive forest land base for the four planning terms spanning 1990 to 2011. The TMPs (1990-1996, 1996-2001) did not require all of the detail on protection forest, stage of management or available volume, so these Table 5s are incomplete. The overall trends in available productive forest land base have already been discussed relative to Table 1. The most significant trend is the reduction of production forest area resulting from the implementation of the Ontario's Living Legacy land use strategy.

The overall age class structure shows an aging forest with insufficient recruitment and a significant proportion of the forest between 60 and 100 years old. This picture has been relatively consistent over the course of these four terms and does not 'appear' to be improving. However this is an inaccurate

picture because the lack of recruitment is largely artificial due to the level of partial harvesting that occurs in the Ottawa Valley Forest. Forest stands harvested under the selection system, most stages of management under the shelterwood system, and a significant component of the mixedwood 'clearcuts' do not deplete stands below 0.3 stocking. By default these stands remain in the inventory as mature stands that continue to age. While the FRI architecture has been redesigned to record understory characteristics in shelterwood stands, to date this component has not been populated. It is OVFI's position that using the FRI to document recruitment in uneven or irregular aged stands is inefficient as the information is available from other sources such as annual report coverages (e.g. FTG coverage). Middle ground could be to use simpler attribute codes to identify development stages where understory recruitment has been successful. (*OVFI has been working with the District, the Regional Silviculture Specialist and the Southern Science and Information to address this issue for mixedwood clearcuts in particular.*)

An accurate inventory of stage of management is critical to managing the shelterwood forest units, with implications for projecting wood supply, wildlife habitat and landscape diversity in both SFMM and the spatial modelling tools. The 1990-1995 and 1996-2001 TMPs arbitrarily assigned stage of management based on age and in the 2001-2006 FMP the stage of management was assigned to forest stands based on age and stocking criteria. This was necessary due to timing and lack of appropriate records to assign stage of management based on the last known harvest activity and actual stand conditions (overstory and understory). This is proving to be a cause for concern as the trend in the 1990-1996 FMP was to have more seed cut than planned; and in the 2001-2006 period it was generally to have more removal cuts than planned. The company has been improving on this stand attribute as much as possible as part of the ongoing FRI maintenance, but this limits the information to stands that have been encountered on the ground. In all of the shelterwood forest units it has become apparent that the majority of stands have been harvested and or developed in such a way that a preparatory cut is in not necessarily required. For this reason preparatory cuts are not automatically assumed in the representation of pine shelterwood management in the Strategic Forest Management Model, but with some knowledge of the stand conditions may be included as 'hard-wired' mid-rotation treatments. This is necessary to prevent over-estimation of available harvest area and volume.

As described in the Description of Forest Units (Table 2) there have been three changes in the classification of the forest during the period covered by this Trend Analysis. The criteria and rationale have changed significantly over time. This change to forest unit definitions over the four planning periods makes it impractical to track the changes in the productive forest at the forest unit level. Forest units will probably change yet again for the 2011-2021 FMP to align as much as possible with the Landscape Guide forest units. It will take several planning cycles of using the same forest units (and the same reporting format) to derive any meaningful trends directly from Table 5.

The types of forest unit conversions occurring (planned and unplanned) and the relationship to FMP objectives is summarised as follows:

CE1 The 2006-2011 FMP includes an objective to maintain the representation of this forest unit at 2001 levels. The management strategy includes a deliberate and very conservative available harvest area (AHA) as these stands are frequently bypassed for reasons of operability (requires frozen conditions) and because they are of high value for wildlife habitat (winter cover). These stands are harvested and renewed naturally (unassisted) using a one in three strip cut (20 metre width). There is limited data available on the success of the treatment as there are few examples, and the establishment period is long (FTG period is set at 12-15 years). The general observation is that cedar regeneration can be secured but achieving FTG status can be complicated by deer browsing, and competition from associates such as balsam fir, tamarack, black ash and balsam poplar. However, the FMP objective will likely be surpassed through conversion from other forest units. The representation of cedar on the management unit is expanding through natural encroachment beneath the canopy of adjacent forest types. The shade tolerance of this species allows it to thrive in mixedwood conditions and with selective careful logging methods it has been successfully retained to form a dominant component of future stands.

CM1 The 2006-2011 FMP does not have an objective for this forest unit generally because natural stands tend to be dominated by balsam fir , which is of lowest priority for timber, diversity and wildlife habitat. The forest unit is generally expected to expand for the same reasons as CE1, as the shade

tolerance of the principal conifer species allows them to become established beneath the canopy of other forest types. Generally, the retention and protection of balsam fir advanced growth is not promoted, but retention of all other conifers is.

The 2006-2011 FMP does have an objective to increase the representation of white and red spruce as a component of the CM1 forest unit through intensive artificial regeneration. While the planting of spruce is not a new initiative, in the past it was limited and typically very localised within larger planting projects for white and red pine. The 2001-2006 FMP began an initiative to increase the level of white and red spruce being planted and where possible to concentrate on larger blocks of strategic value for wildlife habitat (e.g. cover). During the 2001-2006 term approximately 160,000 white spruce and 60,000 red spruce have been planted under this initiative. It is anticipated that these plantations will start to be declared FTG and enter the inventory beyond 2016.

HD1 The HD1 forest unit represents forest stands dominated by the shade tolerant hardwoods, particularly hard maple and beech that will be managed under the selection system to create or perpetuate uneven-aged stands. Stands managed under the selection system are considered perpetually FTG, so the forest unit is by definition considered to be stable, and is in fact expanding through natural succession. The shade tolerance of most of the principal species allows them to become established in the understory of other forest types. Where this occurs on good hardwood sites this regeneration is encouraged and promoted. In some instances this regeneration conflicts with the renewal of other desirable species (e.g. red oak, white pine).

The 2006-2011 FMP does not include an objective for the HD1 forest unit unit generally, but does have an objective for the yellow birch component. Yellow birch dominated stands are relatively rare in the Ottawa Valley Forest. Incidental groups and patches of yellow birch within the selection forest unit are managed under group selection, but when extensive areas of yellow birch are encountered the silvicultural system may be switched to uniform shelterwood. Only one uniform shelterwood for yellow birch has been implemented and the results are promising. Isolated treatments of group selection for yellow birch have not been routinely assessed.

HE1 The HE1 forest unit has been created to recognise the diminished condition of the hemlock population and the important ecological role of hemlock forest types on the Ottawa Valley Forest. Prior to the 2001-2006 FMP the hemlock forest type was lumped in with tolerant hardwoods so there was no control on the harvest allocation of this specific forest type. Creating a separate forest unit for hemlock has provided control over the determination of the area available for harvest and will facilitate monitoring of restoration and recovery of this forest type. The 2006-2011 FMP includes an objective to maintain the representation of this forest unit at 2001 levels. The management strategy includes a deliberate and conservative available harvest area (AHA) and a small component of tree planting. Several hemlock shelterwood removal cuts have been quite successful, but the largest gains are being made in conversion from other forest types. As described in the previous forest units, the shade tolerance of this species allows it to establish under the canopy of other forest types, typically after some type of logging disturbance. Careful logging techniques are used to retain and protect advanced growth of hemlock resulting in low cost conversions.

INT1 The INT1 forest unit was created to recognise stands with 70 percent or more poplar and/or white birch, which are sufficiently different in ecological and yield terms to be separated from mixedwood conditions. The 2006-2011 FMP does not include an objective for this forest unit. The INT1 forest unit is expected to decline over time due to the influence and exploitation of natural succession occurring below the main canopy. INT1 stands that lack diversity in the understory are expected to regenerate naturally back to poplar and white birch dominated stands that will remain in the INT1 forest unit. However, many stands within this forest unit are being converted to a mixedwood condition (typically MW1 or MW3) through the planned retention and protection of desirable species that have become established in the understory. This forest unit is also being converted to mixedwood due to the prolificacy of less desirable species, red maple and balsam fir in particular, that can not be fully utilised or otherwise remain entrenched due to abundant advanced regeneration and/or vegetative reproduction.

LH1 LH1 represents lowland forest where black ash and to a lesser extent, other lowland hardwood species dominate the stand composition. The lowland hardwoods are a relatively minor ecosite type in the Ottawa Valley Forest, and as such, they potentially represent some unique habitats. The LH1 forest unit has been created primarily to recognise the diversity value of maintaining these unique forest communities. Prior to the 2001-2006 FMP the lowland hardwoods were rolled together with the upland tolerant hardwoods and hemlock. A greater measure of control on the harvest allocation has been achieved by creating a separate forest unit. Monitoring the status of this forest type is also facilitated.

Being a lowland forest type, LH1 poses operational harvesting problems. Black ash occurs on sites that are subject to intermittent flooding and generally the species favours soils that are saturated most of the year. This restricts harvesting to winters of prolonged deep cold with minimal snow when machinery can operate effectively without causing site damage. The combination of these factors has historically made it difficult and/or uneconomical to harvest anything more than the fringes of lowland hardwood sites on the Ottawa Valley Forest. The 2006-2011 FMP does not have an objective for this forest unit. LH1 is managed using the single tree and group selection silviculture systems to promote natural regeneration of uneven-aged stands. This forest type is considered perpetually FTG and by definition is considered to be stable.

MW1 The MW1 forest unit represents forest stands that are in a transitional state. Disturbance from periodic high-grade logging and the suppression of wildfire have combined to produce forests that are a mixture of pioneer and late successional species, often with two or more age classes represented. The pioneer species tend to dominate in the mature overstory and the shade-tolerant late successional species are typically present in a super canopy position (residuals from a previous harvest), or in codominant or intermediate positions within the main canopy. These species may also be present as advanced growth in the understory.

The 2006-2011 FMP does not include an objective for this forest unit, but it is influenced by the objectives for other forest units and individual species, which make it subject to both conversions in and conversions out. This forest unit is being converted to some extent to other forest units (PW1, PW2, MW3, HD1, HE1) through the planned retention and protection of desirable species (from any canopy position). Conversions in to the MW1 forest unit come primarily from the INT1 forest unit as described above, or from silvicultural failures in other forest units. The success of this mixedwood management is difficult to assess in the traditional manner as frequently the stands are not fully depleted (i.e. retain >= 30% stocking) and by definition remain FTG. Consequently, these stands have fallen into the grey zone and have not been reported in the Annual Report tables as traditional even-aged clearcut harvest and renewal. The company, the District MNR and Regional MNR are looking at ways to improve the assessment and reporting of mixedwood management.

MW3 MW3 is of very similar composition to the MW1 forest unit but it has sufficient white pine and/or red pine in the overstory to implement a clearcut with seed trees. The MW3 forest unit has been created to recognise the probability that these poplar-dominated mixedwood sites were once pine sites and therefore have an ecological and historical priority for conversion back to pine. The 2006-2011 FMP has an objective to convert 20% of all MW3 sites harvested to PW1 or PR1 forest units using artificial regeneration techniques. This target may not be achieved in the 2006-2011 term due to the reallocation of renewal effort to restoring the extensive blowdown sites of 2006 and 2007. During the 2001-2006 term approximately 440 hectares of MW3 were treated for conversion (approximately 39% of MW3 harvested). Assessment of these 2001-2006 areas for FTG status will begin in 2013.

In terms of natural regeneration options the MW3 forest unit is functioning much like the MW1 forest unit with conversions occurring both in and out through the retention and protection of desirable long-lived species within the canopy and present as advanced growth. Over the long term, the MW3 forest unit is predicted to decline as more is converted out through the artificial regeneration program than converts in form other forest units.

OC1 OC1 is the second lowland conifer forest unit used to distinguish the black spruce and larch dominated types from the cedar-dominated types. The OC1 forest unit has been created primarily to

recognise the diversity value of maintaining this forest type that is transitional between the Great Lakes-St. Lawrence forest and the Boreal forest. Because of its adaptations to regenerate after fire, black spruce would likely have been better represented in the presettlement forest, particularly on the interface between lowland and upland sites.

In the 1996-2001 TMP the OC1 forest type was rolled together with the CE1 forest type as one larger lowland conifer forest unit. Having a unique forest unit for each of these forest types provides more control on the harvest allocation and facilitates monitoring of their status.

The 2006-2011 FMP does not include an objective for the OC1 forest unit. However, the management strategy includes a deliberate and very conservative available harvest area (AHA) as these stands are frequently bypassed for reasons of operability (requires frozen conditions). These stands are harvested and renewed naturally (unassisted) using a one in two strip cut (70 metre width). There is limited data available on the success of the treatment as there are very few examples, but the general observation of older disturbances (not necessarily strip cuts) is that desirable regeneration can be secured but the establishment period is long (FTG period is set at 12-15 years. Not unlike cedar, black spruce is also expanding through natural succession beneath the canopy of adjacent forest types. The shade tolerance of this species allows it to thrive in mixedwood conditions (hardwood or conifer) and with selective careful logging methods it can be successfully retained to form a dominant component of future stands. Larch on the other hand is a successful pioneer in clearcuts adjacent to a seed source.

OR1 OR1 is one of the largest forest units on the management unit due to the ability of red oak to thrive on a wide range of sites and because this fire adapted species was favoured by the frequent forest fires that occurred around the turn of the century. The OR1 forest unit has been defined to recognise the important ecological and economic role of red oak on the Ottawa Valley Forest. Provincial policy would suggest that red oak should decline over time because there is probably significantly more of it on the landscape than there was in presettlement forest. However, the value of red oak forests for forest products and for wildlife habitat, particularly for game animals, has shaped local direction to minimise loss of this forest unit to 80% of 2001 levels.

The red oak-white pine-poplar community is a dominant forest type within the OR1 forest unit, which occurs on relatively dry, infertile and often shallow sites (Central Ontario ecosite ES14). Under shelterwood management, natural regeneration of both white pine and red oak is generally easy to secure; through regeneration from seed, protection of advanced growth, and in the case of oak from stump sprouts. It is relatively common to find white pine regenerating beneath an oak dominated canopy and oak regenerating under a pine canopy, or both. The dominant species regenerated in any given stand may differ form the dominant overstory species but at the landscape level the overall complex seems to be relatively stable and can be perpetuated through tree marking and careful logging.

The challenge for the OR1 forest unit lies in the red oak-tolerant hardwood forest conditions, particularly in the southern part of the management unit (ES 23, 24, 25). On these sites advanced regeneration of the more shade tolerant hard maple and red maple tends to become firmly established and quickly takes advantage of canopy gaps created by harvesting. Silvicultural investment for oak renewal is concentrated on these sites. Uniform shelterwood is the principal silviculture system, which is being enhanced with vegetation management treatments (site preparation and tending), tree planting and direct sowing. Group selection management is also being explored, which may allow for more focused but lower cost renewal and maintenance. Over time these efforts are expected to reduce the conversion of OR1 to tolerant hardwoods (HD1), but will not eliminate it.

PJ1 Jack pine is another Boreal forest species that is found in the transitional zone in the northern half of the Ottawa Valley Forest. The jack pine forest type has probably diminished since the era of fire suppression began and by the management emphasis on white and red pine. Prior to the 2001-2006 FMP the jack pine stands were rolled into a mixed upland conifers forest unit so there was no control on the harvest allocation of this specific forest type. The PJ1 forest unit has been defined to recognise the diversity and economic value of maintaining the jack pine forest type. Creation of the PJ1 forest unit provides control on the harvest allocation of the jack pine forest and facilitates monitoring of its restoration and recovery.

The 2006-2011 FMP has an objective to maintain or increase the representation of the PJ1 forest unit based on 2001 levels. Jack pine is renewed by natural regeneration, both unassisted and with mechanical site preparation, and by artificial means (tree planting) depending on site conditions. Because some jack pine stands are being converted to white pine through retention and protection of advanced white pine regeneration, it is necessary to convert other forest types to meet the FMP objective. This will typically occur on dry, infertile sites from the INT1, MW1 or CM1 forest units.

During the 2001-2006 term, 41 hectares of PJ1 were harvested and 48 hectares were declared FTG.

PR1 Prior to the 2001-2006 FMP red pine dominated stands were rolled in with the white pine forest units. Historically, red pine has been discriminated against in favour of white pine, largely because red pine is much more difficult to regenerate naturally, and with the exception of poles, red pine is of a lower value than white pine. The PR1 forest unit was created to recognise that red pine has an ecological and economic niche on the Ottawa Valley Forest. It is an objective of the 2006-2011 FMP to maintain or increase the PR1 forest unit based on 2001 levels. When practical, the strategy is to renew PR1 stands back to red pine. Having said this, it is a common situation to find abundant advanced white pine regeneration under a red pine overstory. More often than not, it may be determined that conversion to white pine by either a two-cut or three-cut shelterwood may be the most appropriate action for a PR1 stand. The PR1 forest unit will be maintained or increased through conversion of other forest units (typically MW3) on suitable or traditional red pine sites. The success of this approach is discussed in some detail in the review of Table 7.

PR3 The PR3 forest unit is a short-term designation being used to represent intensively managed red pine plantations established primarily on old field sties. In the long-term, these plantations will be managed as PR1 shelterwood stands (i.e. converted out after age 75).

PW1 The PW1 forest unit is the elite white pine forest type and one of the largest forest units on the Ottawa Valley Forest. PW1 represents pine forest stands that have sufficient composition of white pine (and red pine) to implement a three-cut uniform shelterwood harvest system. The 2006-2011 FMP has an objective to increase the PW1 forest unit from 2001 levels. Maximising regeneration success in the PW1 forest unit is identified as a top priority to achieve this objective. The objective will also be achieved by conversion to PW1 from shelterwood forest units (PR1, PW2, OR1) by both artificial and natural regeneration; from intensive artificial conversion of clearcut forest types (primarily MW3 as already mentioned); and to some extent from the retention and protection of advanced growth in mixedwoods (INT1, MW1, MW3).

Observations from FTG assessments to date are not encouraging but these are taken almost exclusively from the period before the complexities of pine shelterwood management were properly implemented, and the period before dedicated silviculture funding from the Forest Renewal Trust was established. Observations from interim regeneration assessments of more recent harvest and renewal efforts indicate that things are improving. This is attributed to improved tree marking, better utilisation, more emphasis on artificial regeneration and more timely maintenance. The contribution of conversions from mixedwoods also needs to be quantified.

The extensive blowdown events of 2006 and 2007 have dealt a severe blow to the restoration of the PW1 forest unit as many of the wind damaged stands were PW1 stands where renewal efforts were just being initiated. Many of these areas will now be renewed to red pine due to the open conditions that have been created.

PW2 The PW2 forest unit represents mixedwood stands with white pine composition that is intermediate between the MW3 forest unit and the PW1 forest unit. These stands have sufficient white (and red pine) to implement a two-cut uniform shelterwood harvest system. Many of these stands were probably good pine stands that were high-graded by a diameter limit harvest 20-40 years ago. PW1 regeneration cuts harvested 12-15 years ago that have failed may also be reclassified as PW2 stands to allow the regeneration cut to be repeated. The 2006-2011 FMP identifies PW2 stands as a top priority for restoration to the PW1 condition, which will ultimately lead to the decline of this forest unit.

As described in the PW1 discussion, improving regeneration success in pine shelterwood management is a top priority. No distinction is drawn between the pine forest units in this regard.

Summary of Renewal and Maintenance -Planned vs. Actual (Table 6)

Table 6 compares the renewal and maintenance accomplishments to the renewal and maintenance planned in the periods 1990-1996, 1996-2001, 2001-2006 and 2006-2011. Information on planned and actual renewal and maintenance activities for the 1990-1996 and 1996-2001 terms was taken from table RPFO-7 of the respective RPFOs. Information for the 2001-2006 term was taken from table AR-7 of the 2005-2006 annual report (fifth year report). Planned levels of renewal and maintenance for the 2006-2011 term were taken from table FMP-25 of the 2006-2011 FMP. The actual level of renewal and maintenance for 2006 only, was taken from table AR-7 of the 2006-2007 annual report.

1990-1996

This period is significant as the era before dedicated funding for silviculture became available, which may explain the lack of achievement in the areas of artificial renewal and tending.

Highlights:

1. Natural regeneration by selection is consistent with the harvest levels.
2. Natural regeneration by clearcuts is not consistent with the harvest level due in part to the practice of treating poplar stands with an understory of advanced regeneration of white pine as 'shelterwood - first removals', which are not reported as a renewal treatment. . This may be giving the false impression that these stands are not being renewed. Many poplar clearcuts were also treated artificially to convert to pine.
3. Natural regeneration by uniform shelterwood is greater than expected in light of harvest levels. This may be attributed to the fact that stands anticipated to be prep cuts or removal cuts were actually treated as seed cuts.
4. Artificial regeneration treatments (tree planting, scarification and site preparation) are lower than expected in light of the harvest levels (approximately 40% achievement vs. 60% harvest level).
5. Similarly, tending treatments are also lower than expected compared to harvest levels (approximately 40% achievement vs. 60% harvest level).
6. Aerial spraying was essentially not used in this management unit during the 1980's and early 1990's; herbicides were applied primarily with the air blast sprayer.

1996-2001

This period is significant because of the implementation of the Special Purpose Account/Forest Renewal Trust funding mechanisms and access to additional funds from the Forestry Futures Trust. On an area basis, the harvest level in 1996-2001 was directly comparable to the previous period. Comparisons of annualised actual treatments between periods are therefore valid and may indicate if the renewal funds resulted in more emphasis on renewal and maintenance activities.

Highlights:
(*Ratios for accomplishments for the 1996-2001 period are determined by dividing the actual accomplishment to March 31, 2001 by the planned level shown in table 4.19 of the TMP. However, because we are comparing five-year accomplishments to six-year accomplishments, comparisons of the 1996-2001 period to the 1990-1996 periods were determined by dividing the annualised achievement from the period 1996-2001 by the annualised achievement from the 1990-1996 period.*)

1. Natural regeneration by selection is more or less consistent with the harvest levels.
2. As in the previous period natural regeneration by clearcuts is not consistent with the harvest level due in part to the practice of treating poplar stands with an understory of advanced regeneration of white pine as 'shelterwood - first removals'. This may be giving the false impression that these

stands are not being renewed. Many poplar clearcuts were also treated artificially to convert to pine.

3. Natural regeneration by uniform shelterwood is much greater than planned, particularly in light of the 75% harvest accomplishment. This can only be attributed to the fact that stands anticipated to be prep cuts or removal cuts were actually reported as seed cuts. This emphasises the point about improving the inventory to accurately reflect the stage of management for the shelterwood forest units. On an annualised area basis the accomplishment is approximately 115% of the previous period.
4. Planned tree planting was down significantly in this period with more focus being put on mechanical site preparation to assist natural regeneration in shelterwoods (formerly documented as scarification). On an annualised basis the actual area of tree planting was only 80% of the 1990-1996 period.
5. On an annualised basis planned site preparation was up 139% from the 1990-1996 period with the increased emphasis on assisting natural regeneration in the pine shelterwood seed cuts. On an annualised basis actual site preparation was 178%of the 1990-1996 period.
6. Planned tending treatments were up significantly from the previous period (149% for all treatments combined) and included a target for 2,830 hectares of aerial spraying. On an annualised area basis the accomplishment for tending treatments was 124% of the previous period. Actual aerial spraying was almost 2,400 hectares (85% of target).

Overall, the indication is that renewal and maintenance activity did increase compared to the previous period, probably in the order of 25%.

2001-2006

Planned renewal and maintenance levels for the 2001-2006 planning period were very closely linked to the assumptions made in the Strategic Forest Management Model to reflect the selected management alternative. It is believed that these targets are more realistic than those of past planning periods. The proof will be not in the accomplishments relative to planned levels but whether the effort in renewal and maintenance is adequate to achieve regeneration success as planned. This will only be determined over the longer term through the ongoing monitoring of regeneration success and changes in forest composition.

The overall level of natural regeneration (selection, clearcut, and shelterwood seeding cut) is low when compared to the five-year forecasts (73%). This is primarily the consequence of harvest progress, which was 74% of the plan forecast.

1. Natural regeneration by the selection system was only 45% of the five-year forecast, due to the low level of harvest in the HD1 and LH1 forest units.

Note that in the first few years of the FMP conventional or seed tree clearcuts that were being considered for conversion with artificial regeneration were not reported in the year of depletion. These areas were held in limbo and were either reported as artificial regeneration in the year that tree planting took place or as natural regeneration if the planting did not come to pass. Keeping track of the area in limbo proved to be onerous and increased the risk of area not being properly reported. After discussion with the District MNR it was decided to report all clearcuts as natural regeneration in the year of harvest and to then report any subsequent artificial regeneration as a supplemental treatment to avoid any double counting. This was consistent with the approach already being used for shelterwood regeneration cuts. To this end all clearcuts reported in AR-1 and AR-2 were reported in the to-date column of AR-7, and any planting previously associated with this area has been moved down to the supplemental category to eliminate any double count.

2. The level of natural regeneration by conventional clearcut harvest was approximately 144% of the level proposed in the FMP, with strip cutting at 24% and seed tree at 117%. The accomplishment is significantly greater than forecast because of: a) the good rate of utilisation of the intolerant hardwoods and mixedwoods; and b) forest unit corrections in Forest Operations Prescriptions,

which resulted in significantly more area in intolerant and mixedwood forest units in the completed harvest than planned.

3. The level of natural regeneration by shelterwood regeneration cut was only 60% of the five-year forecast in the FMP. Shelterwood regeneration cut accomplishments appear low because the proportion of shelterwood regeneration cuts relative to prep cuts and removal cuts to date was significantly lower than the overall forecast in the FMP. Shelterwood regeneration cuts were forecast to be 71% of all shelterwood harvests, but the actual proportion was only 57%.

All shelterwood regeneration cuts are reported as natural regeneration in the year of operation, even if they will ultimately be regenerated in whole or in part by artificial means. This is consistent with

- *the intent of the harvest being to secure natural regeneration of the forest unit as a first priority (typically to the same forest unit); and*
- *that artificial regeneration through planting will typically be employed to supplement natural regeneration or to retreat areas that have failed to regenerate.*

All subsequent artificial regeneration is reported as supplemental or as a retreatment to eliminate the double count of regeneration treatments.

4. A total of 3,528 hectares of tree planting was completed during the term representing 117% of the five-year forecast.

5. A total of 2,610 hectares of site preparation was completed over the five years of the FMP representing only 41% of the five-year forecast. This can be attributed in part to the 74% harvest accomplishment and the reduction in area of shelterwood regeneration cuts, but also to a significant amount of the shelterwood harvest being planted without site preparation. This is being accomplished because of cleaner harvest cuts resulting from mechanical harvesting and concurrent or follow-up stand improvement treatments to reduce the undesirable stems in the understory.

   The forecast for mechanical site preparation in the 2001-2006 FMP amounted to 48% of the total forecast shelterwood regeneration cut and seed tree harvest area (principal regeneration cuts where site preparation would/could be used). Actual mechanical site preparation amounted to 39% of the area actually harvested under shelterwood regeneration cut and seed tree cut (effectively 81% achievement). In the development of the 2006-2011 FMP the assumptions for site preparation were reviewed and adjusted. The forecast for mechanical site preparation in the 2006-2011 FMP term is 36% of the forecast harvest area in shelterwood regeneration cut and seed tree cut, which is more in line with actual mechanical site preparation levels that occurred in the 2001-2006 term.

6. There was a major shortfall in chemical site preparation during the 2001-2006 term. Chemical site preparation was forecast at 24% of the forecast shelterwood regeneration cut and seed tree harvest, but actual chemical site preparation amounted to only 5% (effectively 21% achievement). Increased emphasis on chemical site preparation was first introduced to the Ottawa Valley Forest in the 2001-2006 term (only 350 hectares forecast in the 1996-2001 term), but logistical issues made it difficult to get the program up and running. One of the most significant impediments was working in the extra year delay required between harvest and tree planting when the planting stock was already on order (up to three years in advance). Other factors include:

   - *limited herbicide choices* – The only approved herbicide for air blast application during most of the 2001-2006 term was Vision® or other generic first generation glyphosate formulations, which were only really effective against poplar and white birch. This made it impractical to use chemical site preparation on sites where red maple or other glyphosate tolerant species were a concern. New glyphosate formulations (e.g. Vision Max®) have been shown to be much more effective against these resistant species, particularly at site preparation application rates. This will increase the opportunity to use chemical site preparation in future years.

- *AOCs, MOE 60 m buffers* – On smaller treatment areas MOE buffers on water and AOCs for other values can reduce the area available for chemical site preparation to the point where chemical site preparation with the air blast sprayer is impractical. Other application techniques may provide opportunities to conduct chemical site preparation in these areas.
- *voluntary no broadcast zone* – OVFI has agreed to not use broadcast application techniques within a 25 kilometre (15 mile) radius of a resident in Lavant Township (Lanark County) that is afflicted with severe chemical sensitivities. This has restricted chemical site preparation opportunities substantially in the southern portion of the management unit. A change in this person's circumstances or other application techniques may make chemical site preparation possible within this zone.

The 2006-2011 FMP stresses the advantages of good vegetation management through chemical site preparation (versus tending) and contains a specific strategy to use herbicides more effectively by increasing the use of chemical site preparation (Sec. 3.6.4 of the 2006-2011 FMP). The forecast for chemical site preparation during 2006-2011 is effectively the same as in the 2001-2006 term (relative to forecast regeneration harvests), but the emphasis will be on improving achievement. If there is a silver lining to the 2006-2007 blowdown event in the north part of the district, it is that it may provide the opportunity (i.e. delay) to work more chemical site preparation into the renewal program during the 2006-2011 FMP term.

7. A total of 4,534 hectares of cleaning was completed over the five-year term, which is 103% of the FMP target. The forecast aerial spray in Clara Township was replaced by ABS treatment. All sites being monitored are being tended in a timely fashion, but more stem-specific treatment and less broadcast treatment (ABS) is being conducted than planned due to AOC and other constraints.

   Five-year accomplishments for thinning/stand improvement cannot be compared to the FMP forecasts as these forecasts included all areas of hardwood forecast for harvesting under the selection system and all oak shelterwood prep and seed cuts. This was consistent with past assumptions that stand improvement was an inherent component of these harvests. However, it was felt by the SFL that the numbers were somewhat artificial since there is little connection to the level of stand improvement activity and silvicultural expenditure for this activity. Stumpage incentives, a strong fuelwood market, and improved small sawlog technology have combined to increase the utilisation of the stand improvement component of these harvests. After discussion with MNR Forest Evaluation and Standards Section it was decided it would be more appropriate to represent in AR-7 only the stand improvement activities that are being paid for using Forest Renewal Trust (FRT) or Forestry Futures Trust (FFT) funds.

8. No protection activities were conducted during 2001-2006.

<u>2006-2011</u>

1. Natural regeneration levels were consistent with the low harvest levels.

2. 858 hectares of tree planting occurred in 2006-2007, representing 33% of the five-year forecast.

3. The blowdown impacted planned site preparation activities in 2006-2007 because site preparation could not proceed on many sites until salvage had been completed. White/red pine stands recently harvested under the uniform shelterwood system were most affected. Only 451 hectares of site preparation were completed (10% of the five-year forecast) including 365 hectares of mechanical site preparation and 86 hectares of chemical site preparation.

4. The blowdown did not have a significant impact on planned tending activities. A total of 747 hectares of cleaning was conducted in 2006-2007 (22% of the five-year forecast) including:
   - 178 *hectares of manual cleaning (brushsaw); and*
   - *569 hectares of* ground-based chemical tending.

Due to the low level of normal harvest activity there were no funded thinning/stand improvement projects conducted in 2006-2007

Reduced harvest activity and reductions in renewal rates on a significant component of the salvage volume could place a strain on the Forest Renewal Trust as the company attempts to deal with renewal of both the blowdown and regular harvest.

Summary of Table 6

The forest management scene has changed significantly over the four planning terms considered here. During the period 1990-1996 the forest managers essentially did the best they could with the available funds, which may not have been consistent with the level of harvest activity or the perceived requirements for renewal and maintenance. Post-1996, the dedicated funding from renewal fees, and the availability of additional funding from Forestry Futures Trust, appears to have stimulated an increase in renewal and maintenance activity in the order of 25%. Linking planned renewal and maintenance activity to the assumptions used in the development of the selected management alternative has resulted in more realistic planned levels of renewal and maintenance activity in the 2001-2006 and 2006-2011 FMPs. The most significant trend in the renewal and maintenance program since 2001-2006 is a gradual shift from stand conversions (poplar to pine) to improving the success of pine shelterwood management.

Harvested Area Successfully Regenerated - 1993-1998 Harvest (Table 7)

Table 7 summarises the area harvested during the period April 1, 1993 to March 31, 1998, and follows this harvest area through to March 31, 2008 to determine the total area surveyed, and to determine regeneration success and the proportion of this area that was determined to be Free-to-Grow (FTG). All areas are gross hectares that have not been netted down for roads and landings (estimated at <3%).

Harvest area has been compiled from:

- annual report tables '*Annual Report of Harvest Area by Silvicultural System*' in the 1993-1994 and 1994-1995 annual reports for the BCMU and MCMU;
- 1995-1996 — table RPFO-1 for 1995-1996 Contingency Plan for BCMU and MCMU;
- 1996-1997,1997-1998 — annual reports for PCMU table AR-1.

Regeneration results have been compiled from the 1996 to 2006 annual reports tables AR-9 and AR-14 as well as silviculture and survey records.

A total of 16,512 hectares were reported as harvested during the five-year period of 1993-1998. (*Approximately 160 hectares of the harvest area was subsequently lost to parks in the Ontario's Living Legacy Land Use Strategy.*)

3,005 hectares were harvested under the selection system (uneven-aged management). This area is considered perpetually FTG and was not surveyed for regeneration success. The current practice is to survey these areas after the harvest to update the inventory to reflect the post-cut stocking and species composition.

The remainder of the harvest (13,507 hectares) was under even-aged management. 5,167 hectares of the even-aged management were not surveyed for regeneration success because the harvests were not renewal cuts (e.g. prep cuts, removal cuts). As for selection, the current practice is to conduct post-cut surveys of these areas so the inventory can be updated to reflect the post-cut stocking and species composition.

Of the remaining 8,340 hectares:

- 5,809 hectares have been surveyed to date; 2,531 hectares potentially remain to receive a FTG survey.

- FTG period for most shelterwood situations is 12-15 years after the seed cut, so area from the 1993-1998 period still remains to be surveyed.
- 1995-96 was the year of downsizing in OMNR — there is a paucity of silviculture records from this year to base a survey program on (i.e. spatial support for the AR and RPFO numbers is lacking).

Of the 5,809 hectares surveyed:

- 4,295 hectares have been declared FTG (a combination of target and other forest units — refer to the annual reports)
- 1,514 hectares are NSR
  - 85 hectares are adequately stocked but require tending
  - the balance is in pine shelterwood seed cuts that are complete failures that require retreatment (most include repeating the seeding cut)

Trends By Forest Unit/Type

The following regeneration trends are taken from the 2005-2006 Annual Report (tenth-year format), which summarises the assessments made during the 2001-2006 term. With the exception of the intolerant hardwood and mixedwood clearcuts, most of the results summarised here represent forest management before the inception of dedicated silviculture funding from the Forest Renewal Trust (FRT). FRT funding since 1995 has allowed for more intensive and timely treatments to occur.

Planned natural regeneration of intolerant hardwoods and mixedwoods has a success rate of 100% and it is achieved within the FTG window of three years. In reality many mixedwood stands are in a perpetual FTG situation with an irregular age class structure as described in the Table 5 discussion. The ability of trembling aspen and largetooth aspen to reproduce vegetatively from suckers and the presence of advanced regeneration of many other species are the key factors in this rapid renewal. Many of the mid-tolerant and tolerant hardwoods may also reproduce vegetatively from stump sprouts. Depending on stem age and other factors this coppice growth can make a significant contribution to the future stand.

The success rate for planned natural regeneration of white and/or red pine under pine uniform shelterwoods is only 32%. 6% of the area has failed to meet the regeneration standards for PR1 or PW1 but has been declared FTG to a different forest unit than planned. The balance of the area (62%) has failed to reach the regeneration standards within the FTG period. The success rate for planned artificial regeneration of white and/or red pine under uniform shelterwoods is somewhat better than for natural regeneration, but is still only 47%. 2% of the area has failed to meet the regeneration standards for PR1 or PW1 but has been declared FTG to a different forest unit than planned. The balance of the area (51%) has failed to reach the regeneration standards within the FTG period.

Dense overstory conditions (not marked hard enough, not adequately thinned from below, interfering mid-canopy) and a lack of timely intervention (supplemental planting and/or tending) are the most likely reasons for failure on these pine shelterwood sites. Infection by white pine blister rust may be another contributing factor on some sites. Some of these areas that have not been declared FTG have adequate stocking of regeneration but will require additional time and/or tending before they can be declared FTG. Others will require re-treatment, which may include a second regeneration cut to achieve desired crown closure. Observations from interim regeneration assessments of more recent harvest and renewal efforts indicate that things are improving. This is attributed to improved tree marking, better utilisation, more emphasis on artificial regeneration and more timely maintenance. The 2006-2011 FMP proposes a strategy to increase the use of chemical site preparation to improve establishment and early growth. Conflict with Area of Concern prescriptions, sometimes on a large scale (e.g. deer yards), is an impediment to using this critical renewal tool.

The discouraging results in white and red pine renewal under the shelterwood system are offset to some degree by: a) the planned conversion to white pine and red pine by artificial regeneration (tree planting) in intolerant hardwood or mixedwood clearcuts; and b) the conversion from other forest units through the retention and protection of advanced growth that is present. It is possible to estimate the contribution of

the former from FTG results but the contribution from the latter can not as stands that were not depleted below 30% stocking have traditionally not been reported with FTG assessments.

The success rate for conversion of clearcut sites to red pine has a success rate of 71%. Intensive site preparation treatments, followed by tree planting and follow-up tending have been the most successful approach. An additional 17% of the area assessed has failed to meet the regeneration standards for PR1 but has been declared FTG to a different forest unit than planned. The remaining 12% is adequately stocked with red pine but may need more time and/or tending to achieve FTG. With some minor improvement this conversion program is effective at meeting the FMP objective for maintaining or increasing the PR1 forest unit.

Planned conversion to white pine by artificial regeneration (tree planting) in clearcuts has achieved a lower success rate of 61%. 29% of the assessed area has failed to meet the regeneration standards for PW1 but has been declared FTG to a different forest unit than planned. These failures are attributed to a combination of white pine blister rust infection, weevil damage and competition. The remaining 10% is adequately stocked with white pine but may need more time and/or tending to achieve FTG.

Changes in the 2006-2011 FMP to reduce the impact of white pine blister rust include more emphasis on the planting of red pine, and when selecting sites for white pine that minimise the environmental factors of high humidity and poor drying.

Based on only a small sample of oak regeneration cuts that occurred between 1983 and 1995, the success rate for planned natural regeneration in oak uniform shelterwoods is 86%. The remaining 14% may need more time, tending or re-treatment to achieve FTG status. OVFI is not making any specific commitments to regeneration success on oak sites harvested before 1995 ('Z' lands), because many oak sites were harvested under the selection system during this period and are now strongly dominated by hard maple and other tolerant hardwoods; or due to a lack of timely follow-up, any shelterwood regeneration cuts are likely to have limited oak regeneration to work with. Plans will have to be based on what is found. FTG assessments for oak regeneration cuts conducted during the 1996-2001 FMP term will occur over the period 2008-2016, so results will begin to flow during this term that reflect the impact of dedicated silviculture funding from the Forest Renewal Trust. Enhanced with vegetation management treatments (site preparation and tending), tree planting and direct sowing are being explored as a means to ensure that red oak is regenerated on hardwood sites. Group selection management is also being explored as a means of applying more focused but lower cost renewal and maintenance for oak. Over time these efforts are expected to reduce the conversion of OR1 to tolerant hardwoods (HD1), but will not eliminate it.

The regeneration of hemlock and cedar have been identified as a concern in the 2006-2011 FMP, but with only very small areas being harvested there is limited experience and no regeneration success data available at this time. Forest management plans prior to 2001 did not keep track of hemlock as a separate forest unit and hemlock conditions were typically rolled into selection management with tolerant hardwoods. Prior to 2001 cedar was a component of the CLL forest unit, which was managed under the two-cut strip or patch shelterwood system. A total of 213 hectares of CLL harvest was reported in the 1996-2001 Report of Past Forest Operations; however, this was reported against planned forest unit and not actual. There is no record of any strip or patch shelterwood occurring during the 1996-2001 term. Approximately 50 hectares of hemlock regeneration cut and 40 hectares of cedar strip cut did occur during the 2001-2006 term. This small sample will be monitored closely over the coming years for regeneration success. FTG assessment will not occur until 2013-2021. As described in the discussion of Table 5, both hemlock and cedar are increasing on the landscape through natural succession.

Synopsis of Harvest and Regeneration

It can be concluded that while there are issues of silvicultural success (i.e. *achieving FTG for the target FU*) it can be stated with confidence that regeneration success on Ottawa Valley Forest approaches 100%. The soils, climate and species diversity combine to form a very resilient forest where very few sites remain NSR or B&S.

Based on the 2001-2006 FTG assessments, achievement of the FMP objective for the restoration of white and red pine forests may be best described as being 'on the bubble', but it must be qualified that the areas assessed to date are almost exclusively from the period when a) shelterwood management relied almost exclusively on natural regeneration and tree planting was focused on conversions; b) the combination of light tree marking, and utilisation issues resulted in overstory and midcanopy conditions that were too dense to provide adequate light for sustained growth of regeneration; and c) the lack of dedicated silviculture funding had a negative impact on monitoring and timely maintenance.

Improving regeneration success in pine shelterwood management has been identified as a priority in the 2006-2011 FMP. Strategies being implemented to achieve this objective include:

- reducing the emphasis on conversions of poplar-dominated sites to white and red pine while increasing expenditures on shelterwood silviculture, particularly for intensive site preparation and artificial regeneration (tree planting);
- ensuring proper crown spacing of crop trees, to be achieved with proper tree marking;
- ensuring removal of any interfering mid canopy, to be achieved through improved utilisation, possibly applying stand improvement incentives, or using mechanical site preparation;
- where not limited by AOC prescriptions, increasing the use of chemical site preparation to reduce competition from both herbaceous and woody vegetation in the critical first years of crop establishment;
- not delaying in using artificial regeneration (tree planting) when a) good seed crops are not forecasted and b) adequate natural regeneration has not established within three years of the harvest or site preparation treatment;
- closely monitoring all renewal sites to ensure timely corrective actions such as supplemental planting or tending occur (a flow chart has been developed to manage the monitoring program); and
- ensuring the first (or final) removal cuts occur in a timely manner to ensure that established regeneration receives adequate light to sustain growth.

Issues of Regeneration Success Monitoring and Reporting

Monitoring and reporting of regeneration success in the Ottawa Valley Forest has been an ongoing issue on two fronts. During the 1990-1996 period, as a Crown Management Unit(s), regeneration assessment was often the first program to suffer due to inadequate funding, which resulted in a survey backlog. The 1998 Independent Forest Audit noted this as a serious shortcoming and made the recommendation that "Free-to-Grow surveys for all areas harvested but not yet assessed, must be undertaken for the Pembroke CMU immediately."

Efforts to improve the inventory began in 1997-1998 when a consulting firm was contracted by the MNR to conduct a survey of all partial harvest depletions (shelterwood and selection) that occurred between 1987 and 1996 (i.e. since last new inventory). This survey information was used to update the FRI prior to preparing the 2001-2006 FMP. However, the survey did not include any FTG assessments of clearcut depletions for the same period. The consequence was the significant increase in the B&S class in the 2001-2006 planning inventory.

The company undertook an extensive survey of the 1987–1995 clearcut depletions in the winter of 1999-2001. The survey also included some pre 1987 B&S where possible and practical. This data was used in the FRI update of the 2006-2011 planning inventory. Although silvicultural success issues remain, the result will show a significant improvement in the recruitment of younger age classes.

The company has defined by way of a flow chart in the Annual Work Schedule, a process to be followed to ensure that all sites are monitored in a timely fashion. In addition to timely FTG surveys, the program requires early 'regeneration' surveys of the intensively managed sites to ensure that planted stock is surviving or that natural regeneration has been secured. Retreatments or supplemental plantings may be recommended. Sites are also monitored for competition problems so that tending and/or removal harvest can be timed to maximise early survival and growth of the desired crop species.

A second issue of more recent concern has been the discrepancy between OMNR and company findings, culminating in the complete shutdown of assessment activities by OVFI until the differences were resolved. A joint review of assessment methods was conducted between MNR Pembroke District and OVFI during 2005-2006 to determine why there were discrepancies between company and MNR assessment results. Staff from Southern Science and Information Section (SSIS), MNR were contacted and requested to assist the company and Pembroke MNR in determining the next course of action.

Over the course of two years, discussions facilitated by staff of the SSIS led to the development of a survey methodology that resolved concerns for sampling bias, stocking plot size, competition rules and audit procedures. OVFI has carried out FTG assessments using the new methodology since 2006 and is generally satisfied that it meets the requirements of a reliable silvicultural effectiveness monitoring system. However, the small stocking plot size still seems to be unable to capture the high degree of variation encountered on Ottawa Valley Forest sites (the stats are recommending hundreds of additional plots). Because of this variation the SSIS recommended to OMNR staff that all FTG audits occur on the actual plots tallied. OVFI continues to work with the SSIS and the District to further improve survey procedures, with a view to modifying assessment procedures for regeneration at more advanced stages of development (e.g. at 2 m FTG height or more) and for the two to multi-tiered structures being developed in mixedwood management.

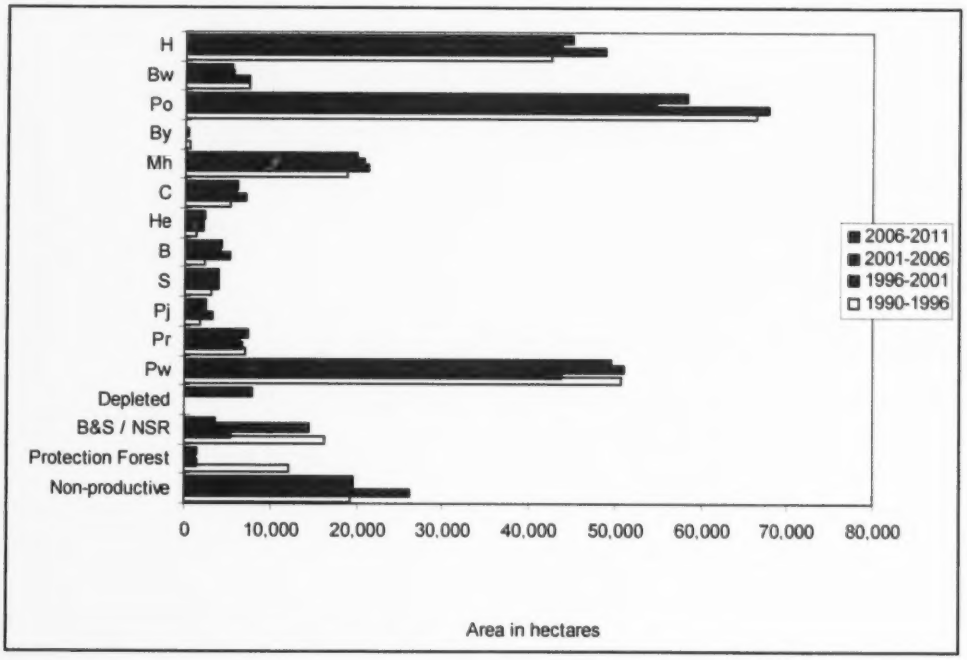
Trend Analysis Tables 1-7

2008 Independent Forest Audit
Table 1 - Summary of Total Area Under Management
Management Unit: Ottawa Valley Forest

Past and Current Plans - Crown Managed

			Area in hectares			
			Past Plans			Current
Land Type		Plan Term	1990-1996	1996-2001	2001-2006	2006-2011
Non-Forested						
Other Land			5,244	4,850	3,754	3,320
Forested						
Non-productive			19,235	26,187	19,562	19,654
Productive						
Protection			12,197	1,440	1,360	1,490
Production Forest						
	B&S / NSR		16,355	5,422	14,419	3,700
	Depleted					7,899
	Working Group					
	Pw		50,720	43,740	51,106	49,627
	Pr		7,066	6,754	6,492	7,346
	Pj		1,830	3,229	2,430	2,404
	S		3,075	4,006	3,888	3,916
	B		2,332	5,199	4,077	4,271
	He		1,236	2,090	2,193	2,361
	C		5,199	6,997	5,897	6,052
	Mh		18,754	21,303	20,685	19,839
	By		436	236	286	236
	Po		66,338	67,790	54,717	58,303
	Bw		7,368	7,405	5,526	5,386
	H		42,516	48,796	43,621	44,928
Total Production Forest			223,225	222,967	215,336	216,269
Total Forested Land			254,657	250,594	236,259	237,413

Source: 1990-1995, 1995-1996 — Table 11 MCMU, Table 10 BCMU TMPs
1996-2001 — Table 4.8.1 PCMU TMP
2001-2006, 2006-2011 — Table FMP-1, FMP-2 OVF FMP



2008 Independent Forest Audit
Table 2 - Description of Forest Units
Management Unit: Ottawa Valley Forest
Plan Term: 1990-1995 TMP and 1995-1996 Contingency Plans Combined

Forest Unit		Forest Type	Main Working	Site Type(s)	Silvicultural System(s)	FRI Parameters & Criteria	Additional Information
Code	Name						
P1	PINE 1	upland - well stocked white and red pine are dominant site classes X, 1	Pw, Pr	NA	4-Cut Uniform Shelterwood	Pw+Pr>=0.3 and Or<0.4 and Pw+Pr+Sw+Or>=0.5 and Stkg>=0.6 and SC=X or 1	140 year rotation
P2	PINE 2	upland - well stocked white and red pine are dominant site classes 2, 3	Pw, Pr	NA	4-Cut Uniform Shelterwood	Pw+Pr>=0.3 and Or<0.4 and Pw+Pr+Sw+Or>=0.5 and Stkg>=0.6 and SC=2 or 3	140 year rotation
P3	PINE 3	upland - poorly stocked white and red pine are dominant all site classes	Pw, Pr	NA	4-Cut Uniform Shelterwood, Clearcut	Pw+Pr>=0.3 and Or<0.4 and Pw+Pr+Sw+Or>=0.5 and Stkg<0.6	140 year rotation Clearcut if low stocking or poor quality
PB1	POPLAR/BIRCH 1	upland - any stocking poplar and /or white birch are dominant site classes X, 1, 2	Po, Bw	NA	Clearcut	Po+Bw>=0.5 and Pw+Pr+Sw<0.5 and Mh+Be<0.3 and Or<0.4 and OH<0.5 and SC=X or 1 or 2	Natural regeneration 80 year rotation
PB2	POPLAR/BIRCH 2	upland - any stocking poplar and /or white birch are dominant site class 3	Po, Bw	NA	Clearcut	Po+Bw>=0.5 and Pw+Pr+Sw<0.5 and Mh+Be<0.3 and Or<0.4 and OH<0.5 and SC=3	Artifical regeneration to convert to white pine, red pine, red spruce, white spruce 80 year rotation
M1A	MAPLE 1A	upland - well stocked maple and other shade tolerant hardwoods are dominant site classes X, 1	Mh, H(Be, Or)	NA	Selection	Mh+Be>=0.3 and Or<0.4 and Mh+Be+By+H>=0.5 and Stkg>=0.6 and SC=X or 1	15-year cycle
M1B	MAPLE 1B	upland - well stocked maple and other shade tolerant hardwoods are dominant site class 2	Mh, H(Be, Or)	NA	Selection	Mh+Be>=0.3 and Or<0.4 and Mh+Be+By+H>=0.5 and Stkg>=0.6 and SC=2	20-year cycle
M2	MAPLE 2	upland - well stocked maple and other shade tolerant hardwoods are dominant site class 3	Mh, H(Be, Or)	NA	3-Cut Uniform Shelterwood, Clearcut	Mh+Be>=0.3 and Or<0.4 and Mh+Be+By+H>=0.5 and Stkg>=0.6 and SC=3	140 year rotation Clearcut if poor quality

2008 Independent Forest Audit
Table 2 - Description of Forest Units
Management Unit: Ottawa Valley Forest
Plan Term: 1990-1995 TMP and 1995-1996 Contingency Plans Combined

Forest Unit		Forest Type	Main Working	Site Type(s)	Silvicultural System(s)	FRI Parameters & Criteria	Additional Information
Code	Name						
M3	MAPLE 3	upland - poorly stocked maple and other shade tolerant hardwoods are dominant all site classes	Mh, H(Be, Or)	NA	Selection, Uniform Shelterwood, Clearcut	Mh+Be>=0.3 and Or<0.4 and Mh+Be+By+H>=0.5 and Stkg<0.6	silviculture system determined on a site specific basis MAD not determined
O1	OAK 1	upland - well stocked oak dominant site classes X, 1	H (Or)	NA	Selection	Or>=0.4 and Pw+Pr+Sw<0.5 and Po+Bw<0.5 and Mh+Be+By+H<0.5 and Stkg>=0.6 and SC=X or 1	20-year cycle
O2	OAK 2	upland - well stocked oak dominant site classes 2, 3	H (Or)	NA	3-Cut Uniform Shelterwood	Or>=0.4 and Pw+Pr+Sw<0.5 and Po+Bw<0.5 and Mh+Be+By+H<0.5 and Stkg>=0.6 and SC=2 or 3	140 year rotation
O3	OAK 3	upland - poorly stocked oak dominant all site classes	H (Or)	NA	Selection, Uniform Shelterwood, Clearcut	Or>=0.4 and Pw+Pr+Sw<0.5 and Po+Bw<0.5 and Mh+Be+By+H<0.5 and Stkg<0.6	silviculture system determined on a site specific basis MAD not determined
OH1	THER HARDWOODS	upland or lowland, well stocked less common tolerant hardwood species are dominant site classes X, 1	H (Ax, Bd), By	NA	3-Cut Uniform Shelterwood	By+H>=0.5 and Mh+Be<0.3 and Or<0.4 and Po+Bw<0.5 and Stkg>=0.6 and SC=X or 1	140 year rotation
OH2	THER HARDWOODS	upland or lowland, well stocked less common tolerant hardwood species are dominant site classes 2, 3	H (Ax, Bd), By	NA	3-Cut Uniform Shelterwood, Clearcut	By+H>=0.5 and Mh+Be<0.3 and Or<0.4 and Po+Bw<0.5 and Stkg>=0.6 and SC=2 or 3	Silviculture system determined on a site specific basis MAD not determined
OH3	THER HARDWOODS	upland or lowland, poorly stocked less common tolerant hardwood species are dominant all site classes	H (Ax, Bd), By	NA	Selection, Uniform Shelterwood, Clearcut	By+H>=0.5 and Mh+Be<0.3 and Or<0.4 and Po+Bw<0.5 and Stkg<0.6	Silviculture system determined on a site specific basis MAD not determined

2008 Independent Forest Audit
Table 2 - Description of Forest Units
Management Unit: Ottawa Valley Forest
Plan Term: 1990-1995 TMP and 1995-1996 Contingency Plans Combined

Forest Unit		Forest Type	Main Working	Site Type(s)	Silvicultural System(s)	FRI Parameters & Criteria	Additional Information
Code	Name						
SP	SPRUCE	upland or lowland white or black spruce dominant all site classes	S (Sw, Sb)	NA	3-Cut Uniform Shelterwood, Clearcut	Sb+Sw>=0.4 and Ce<=0.4 and conifers>=0.7 and Pw+Pr<=0.3 and Mh+Be<0.3 and Or<0.4 and Po+Bw<0.5	Silviculture system determined on a site specific basis MAD not determined
CE	CEDAR	typically lowland white cedar dominant all site classes	C(Ce)	NA	Strip or Patch Clearcut	Ce>=0.4 and conifers>=0.6 and Pw+Pr<=0.3 and Mh+Be<0.3 and Or<0.4 and Po+Bw<0.5 and Sb+Sw<=0.4	MAD not determined
OC	OTHER CONIFERS	upland or lowland other conifers (La, Bf) dominant all site classes	C (La, Bf)	NA	3-Cut Uniform Shelterwood, Clearcut	conifers>=0.6 and not already assigned to another conifer FU	Silviculture system determined on a site specific basis MAD not determined
MISC	MISCELLANEOUS	upland or lowland complex/many species in stand composition	many	NA	Selection, Uniform Shelterwood, Clearcut	everything else	Miscellaneous stand descriptions not already assigned to one of the previous forest units. Silviculture system determined on a site specific basis MAD not determined

Source: Appendix 14 of 1990-1995 TMPs for Bonnechere Crown Management Unit and Madawaska Crown Management Unit

2008 Independent Forest Audit
Table 2 - Description of Forest Units
Management Unit: Ottawa Valley Forest
Plan Term: April 1, 1996 to March 31, 2001

Forest Unit		Forest Type	Main Working Group(s)	Site Type(s)	Silvicultural System(s)	FRI Parameters & Criteria	Additional Information
Code	Name						
Note T.H. = All hardwoods except Po and Bw							
PU4	PINE 4-CUT UNIFORM SHELTERWOOD	upland stands dominated by pine or pine-oak association sufficient stocking of pine/oak for 4-cut U.S.	Pw, Pr		4-Cut Uniform Shelterwood	Pw+Pr>=0.3 and Or>=0.4 and Pw+Pr+Pj+Sw>=Or and Stkg>=0.6	140 year rotation
PU2	PINE 2-CUT UNIFORM SHELTERWOOD	upland stands dominated by pine or pine-oak association insufficient stocking of pine/oak for 4-cut U.S.	Pw, Pr		2-Cut Uniform Shelterwood	Pw+Pr>=0.3 and Pw+Pr+Pj+Sw+Or>=0.5 and Stkg<=0.6	150 year rotation
PBN	POPLAR/WHITE BIRCH NATURAL	upland - any stocking poplar and /or white birch are dominant site classes X, 1, 2	Po, Bw		Clearcut	Po+Bw>=0.5 and Pw+Pr<0.3 and Mh+Be<0.3 and Or<0.4 and T.H.<0.5 and SC=X or 1 or 2	Natural regeneration 70 year rotation
PBC	POPLAR/WHITE BIRCH CONVERSION	upland - any stocking poplar and /or white birch are dominant site class 3	Po, Bw		Clearcut	Po+Bw>=0.5 and Pw+Pr<0.3 and Mh+Be<0.3 and Or<0.4 and T.H.<0.5 and SC=3	Artifical regeneration to convert to white pine, red pine, red spruce, white spruce 60 year rotation
THU	UNEVENAGED TOLERANT HARDWOODS	upland - well stocked maple and other shade tolerant hardwoods (and/or He) are dominant - site classes X, 1, 2	Mh, H(Be, Or)		Selection	Mh+Be>=0.3 and Or<0.4 and T.H.+He>=0.5 and He<0.5 and Stkg>=0.6 and SC=X or 1 or 2	20-year cycle
THE	EVENAGED TOLERANT MID-TOLERANT HARDWOODS	upland - well stocked maple and other shade tolerant hardwoods (and/or hemlock) are dominant - site class 3	Mh, H(Be, Or)		3-Cut Uniform Shelterwood	Mh+Be>=0.3 and Or<0.4 and T.H.+He>=0.5 and He<0.5 and Stkg>=0.6 and SC=3 OR T.H+He>=0.5 and Mh+Be<0.3 and Or<0.4 and Po+Bw<0.5 and Stkg>=0.6	140 year rotation
OAK	OAK	upland - well stocked oak dominant all site classes	H (Or)		3-Cut Uniform Shelterwood	Or>=0.4 and Pw+Pr+Pj+Sw<Or and Po+Bw<0.5 and(T.H.-Or)<=0.5 and Stkg>=0.6	140 year rotation

2008 Independent Forest Audit
Table 2 - Description of Forest Units
Management Unit: Ottawa Valley Forest
Plan Term: April 1, 1996 to March 31, 2001

Forest Unit		Forest Type	Main Working Group(s)	Site Type(s)	Silvicultural System(s)	FRI Parameters & Criteria	Additional Information
Code	Name						
HPS	POORLY STOCKED HARDWOODS	upland or lowland, poorly stocked tolerant hardwood species including oak are dominant all site classes	Mh, H (Or)		Selection, Uniform Shelterwood, Clearcut	Mh+Be>=0.3 and Or<0.4 and T.H.+He>=0.5 and He<0.5 and Stkg<0.6 OR Or>=0.4 and Pw+Pr+Pj+Sw<Or and Po+Bw<0.5 and(T.H.-Or)<=0.5 and Stkg<0.6 OR T.H.+He>=0.5 and Mh+Be<0.3 and Or<0.4 and Po+Bw<0.5 and Stkg>=0.6	Silviculture system determined on a site specific basis MAD determined as clearcut based on 120 year rotation
SPW	WHITE SPRUCE	upland conifers with a high component of white spruce all site classes	S (Sw)		2-Cut Uniform Shelterwood	Sw>=0.3 and Ce+Sb+La<0.4 and Sw+ other conifers>=0.7 and Pw+Pr<0.3 and Pj<0.6 and Mh+Be<0.3 and Or<0.4 and Po+Bw<0.5	100 year rotation
CLL	LOWLAND CONIFERS	lowland white cedar and/or black spruce and/or larch dominant all site classes	C(Ce, L) S(Sb)		2-Cut Uniform Shelterwood	Ce+Sb+La>=0.4 and all coniufers>=0.6 and Pw+Pr<0.3 and Mh+Be<0.3 an Or<0.4 and Po+Bw<0.5	120 year rotation
CMX	MIXED CONIFERS	mixed upland conifer associations may be dominated by jack pine and/or balsam fir all site classes	conifers		Selection, Uniform Shelterwood, Clearcut	conifers>0.5 and Pw+Pr<0.3 and Sw<0.3 and Ce+Sb+La<0.4 and He<0.5 and Mh+Be<0.3 and Or<0.4 and Po+Bw<0.5	Silviculture system determined on a site specific basis MAD determined as clearcut based on 70 year rotation
MSC	MISCELLANEOUS	upland or lowland complex/many species in stand composition by default does not fit eslewhere	many		Selection, Uniform Shelterwood, Clearcut	everything that does not meet the above criteria	Silviculture system determined on a site specific basis MAD determined as clearcut based on 80 year rotation

Source: Appendix F of 1996-2001 TMP for Pembroke Crown Management Unit

2008 Independent Forest Audit
Table 2 - Description of Forest Units
Management Unit: Ottawa Valley Forest
Plan Term: April 1, 2001 to March 31, 2006

Forest Unit		Forest Type	Main Working Group(s)	Site Type(s)	Silvicultural System(s)	FRI Parameters & Criteria	Additional Information
Code	Name						
CE1	Lowland Cedar	lowland - cedar and other conifers are dominant	Ce	34, 33, 32, 22, 21, 23, 20, 17, 30	Strip Clearcut	Sort Order (7) Ce+Ab+La+Sb>= 5 and Po+Bw+Ab+Ew+Ms+Yb<=Ce+Sb+La+Sw+Bf+He and Sb+La+Bf+Sw+He<=Ce and Ce+Sb+La>Ab	
CM1	Mixed Upland Conifers	upland - mixed conifers are dominant	Bf	22, 18, 13, 11, 21, 34, 20, 16, 32, 30, 14, 35, 23, 19, 15, 27, 33	Clearcut	Sort Order (13) Pw+Pr+Pj+Ps+Sb+Sw+Ce+La+Oc+He+Bf>= 7	
HD1	Tolerant Hardwoods	upland - shade tolerant hardwoods other than oak are dominant	Mh	25, 28, 27, 29, 24, 26, 14, 23, 30, 35, 17, 33, 11, 21, 34	Selection	Sort Order (11) Mh+Ab+Aw+Bd+Be+Ch+Ew+Iw+Qr+Yb+Ow+Ob+He>= 4	
HE1	Hemlock	upland - hemlock is dominant	He	30, 28, 23, 27, 14	3-cut Uniform Shelterwood	Sort Order (1) He>= 4	
INT1	Intolerant Hardwoods	upland - shade intolerant poplar and/or white birch are dominant	Po	18, 17, 14, 11, 19, 21, 35, 34, 23, 33, 20, 26, 16	Clearcut	Sort Order (14) Po+Bw>= 7	
LH1	Lowland Hardwoods	lowland - black ash and other lowland hardwoods are dominant	Ax	35, 34, 32, 16, 31, 13, 33	Selection	Sort Order (9) (Ce+Ab+La+Sb>= 5 or Ab>= 2 and Ab+Ms+Yb>= 5 and Qr+Pw+Pr+Pj+Mh+Be<=1) and Po+Bw+Ab+Ew+Ms+Yb>=Ce+Sb+La+Sw+Bf+He	
MW1	Mixedwood	upland - mixedwood dominated by poplar and white birch with other hardwoods	Po	17, 14, 18, 27, 35, 34, 11, 22, 21, 19, 16, 13, 23, 20, 32, 29, 30, 33, 12, 15	Clearcut (with conditions)	Sort Order (15) FU='---' (i.e. everything that did not fit into the other Fus)	
MW3	Mixedwood with White pine	upland - mixedwood with a minor component of residual white pine	Po	17, 14, 18, 27, 11, 22, 21, 35, 20, 13, 34, 23, 29, 30, 16, 33, 26	Clearcut with Seed Trees	Sort Order (12) Pw*Stk>= 1 and Pw>=Pr and Pw+Pr>=Pj and Pw+Pr>=Sb+Sw	
OC1	Other Lowland Conifers	lowland - dominated by black spruce and/or larch	Sb	16, 32, 31, 33, 34, 15, 22, 35	Strip Clearcut	Sort Order (8) Ce+Ab+La+Sb>=.5 and Po+Bw+Ab+Ew+Ms+Yb<=Ce+Sb+La+Sw+Bf+He and Sb+La+Bf+Sw+He>=Ce and Sb+La+Bf+Sw+He>Ab	
OR1	Oak and Oak-Pine	upland - red oak is dominant	Or	14, 24, 23, 25, 17, 29, 35, 27, 28, 13, 18, 26, 21	3 or 4-cut Uniform or Group Shelterwood	Sort Order (10) Qr>=Pw+Pr and Qr>=He and Qr>=Sw and Qr>=Mh+Bd+Aw+Ab+Be+Ch and Qr>=.3 and (Qr+Pw+Pr+He+Sw>=.4 or Qr+Mh+Aw+Ab+Be+Bd+Yb+He>=.4)	
PJ1	Jack Pine	upland - jack pine is dominant	Pj	15, 13, 19, 11	Clearcut	Sort Order (2) Pj>=.5 and Pj>Pw+Pr	
PR1	Red Pine 2-cut	upland - red pine is dominant, white pine usually also present	Pr	12, 11, 20, 14, 13, 18, 16, 29, 21	2-cut Uniform Shelterwood	Sort Order (6) Pr>Pw and Pr+Pw>=Sw and Pr+Pw>=Sb and Pr+Pw>=Pj and Pr+Pw>=Qr and (Pr+Pw*Stk>= 2 and (Pr+Pw+Pj+Sw+Sb+Qr)*Stk>= 25 and Stk>=.5 or Pr+Pw+Pj+Sw+Sb+Qr>=.7)	
PR3	Plantation Red Pine	upland - red pine plantations primarily established on old fields	Pr	12	Row and Selective Thinning	Sort Order (3) Pr>=.5 and Pr>Pw and Stk>=.5 and Age<=50	
PW1	White Pine 3-cut	upland - well stocked pine stands dominated by white pine	Pw	11, 14, 20, 18, 21, 27, 17, 24, 13, 16, 29, 12, 34, 22, 30, 28, 23, 25	3 or 4-cut Uniform Shelterwood	Sort Order (4) Pw>=Pr and Pw+Pr>=He and Pw+Pr>=Sw and Pw+Pr>=Qr and (Pw+Pr>=.5 and Stk>=.7 or Pw*Stk>= 3 and (Pw+Pr+He+Sw+Qr+Pj)*Stk>=.4 and Stk>=.7 or Pr+Pw+He+Sw+Qr>=.7)	
PW2	White Pine 2-cut	upland - mixedwoods with a significant component of white pine	Pw	14, 11, 18, 17, 20, 27, 21, 22, 16, 23, 25, 29, 24, 30, 13, 35, 33, 26	2-cut Uniform Shelterwood	Sort Order (5) Pw>=Pr and Pw+Pr>=He and Pw+Pr>=Sw and Pw+Pr>=Sb and Pw+Pr>=Pj and Pw+Pr>=Ce and Pw+Pr>=Qr and (Pw+Pr)*Stk>=.2 and (Pw+Pr+Pj+He+Sw+Sb+Ce+Qr)*Stk>= 25 and Stk>=.5	

Source: Table FMP-8 of 2001-2006 FMP for Ottawa Valley Forest

2008 Independent Forest Audit
Table 2 - Description of Forest Units
Management Unit: Ottawa Valley Forest
Plan Term: April 1, 2006 to March 31, 2011

Forest Unit		Forest	Main	Site	Silvicultural	FRI Parameters	Additional
Code	Name						
CE1	Lowland Cedar	lowland - cedar and other conifers are dominant	Ce	34, 33, 32, 22, 21, 23, 30, 20, 17	3-cut Strip Clearcut	Sort Order (7), Ce+Ab+La+Sb>= 5 and Po+Bw+Ab+Ew+Ms+Yb<=Ce+Sb+La+Sw+Bf+He and Sb+La+Bf+Sw+He<=Ce and Ce+Sb+La>Ab	PFT[a] = MCL NDPEGFT[b] = Con Low
CM1	Mixed Upland Conifers	upland - mixed conifers are dominant	Bf	22, 18, 21, 13, 11, 34, 16, 20, 32, 30, 14, 23, 15, 27, 19, 35, 33	Clearcut	Sort Order (13), Pw+Pr+Pj+Ps+Sb+Sw+Ce+La+Oc+He+Bf>= 7	PFT = MCU NDPEGFT = Con Upl
HD1	Tolerant Hardwoods	upland - shade tolerant hardwoods other than oak are dominant	Mh	25, 28, 27, 29, 24, 26, 14, 23, 17, 30, 35, 11, 18, 21, 22, 33	Selection Uniform Shelterwood	Sort Order (11), Mh+Ab+Aw+Bd+Be+Ch+Ew+Iw+Qr+Yb+Ow+Ob+He>= 4	PFT = TOL NDPEGFT = Tol Hwd
HE1	Hemlock	upland - hemlock is dominant	He	30, 28, 23, 27, 25, 14	3-cut Uniform Shelterwood Group Selection	Sort Order (1), He>= 4	PFT = MCU NDPEGFT = Con Upl
INT1	Intolerant Hardwoods	upland - shade intolerant poplar and/or white birch are dominant	Po	17, 18, 14, 11, 19, 21, 35, 33, 34, 20, 23	Clearcut	Sort Order (14), Po+Bw>= 7	PFT = POP NDPEGFT = Int Hwd
LH1	Lowland Hardwoods	lowland - black ash and other lowland hardwoods are dominant	Ax	35, 34, 32, 17, 33, 16, 31, 13	Selection	Sort Order (9), (Ce+Ab+La+Sb>= 5 or Ab>= 2 and Ab+Ms+Yb>= 5 and Qr+Pw+Pr+Pj+Mh+Be<= 1) and Po+Bw+Ab+Ew+Ms+Yb>=Ce+Sb+La+Sw+Bf+He	PFT = TOL NDPEGFT = Tol Hwd
MW1	Mixedwood	upland - mixedwood dominated by poplar and white birch with other hardwoods	Po	17, 14, 18, 27, 35, 34, 11, 22, 19, 21, 16, 13, 20, 23, 29, 32, 30, 12, 33	Clearcut	Sort Order (15), FU='---'	PFT = MIX NDPEGFT = GLSL Mix
MW3	Mixedwood with White pine	upland - mixedwood with a minor component of residual white pine	Po	17, 14, 18, 11, 27, 22, 21, 35, 20, 13, 34, 23, 29, 30, 16, 26	Clearcut with Seed Trees	Sort Order (12), Pw*Stk>= 1 and Pw>=Pr and Pw+Pr>=Pj and Pw+Pr>=Sb+Sw	PFT = MIX NDPEGFT = GLSL Mix
OC1	Other Lowland Conifers	lowland - dominated by black spruce and/or larch	Sb	16, 32, 31, 33, 34, 15, 22, 35	2-cut Strip Clearcut	Sort Order (8), Ce+Ab+La+Sb>= 5 and Po+Bw+Ab+Ew+Ms+Yb<=Ce+Sb+La+Sw+Bf+He and Sb+La+Bf+Sw+He>=Ce and Sb+La+Bf+Sw+He>Ab	PFT = MCL NDPEGFT = Con Low
OR1	Oak and Oak-Pine	upland - red oak is dominant	Or	14, 24, 23, 25, 17, 29, 35, 13, 27, 22, 30	3 or 4-cut Uniform Shelterwood	Sort Order (10), Qr>=Pw+Pr and Qr>=He and Qr>=Sw and Qr>=Mh+Bd+Aw+Ab+Be+Ch and Qr>= 3 and (Qr+Pw+Pr+He+Sw>= 4 or Qr+Mh+Aw+Ab+Be+Bd+Yb+He>= 4)	PFT = TOL NDPEGFT = GLSL Mix
PJ1	Jack Pine	upland - jack pine is dominant	Pj	15, 13, 19, 11	Clearcut	Sort Order (2), Pj>= 5 and Pj>Pw+Pr	PFT = PJK NDPEGFT = Con Upl
PR1	Red Pine 2-cut	upland - red pine is dominant, white pine usually also present	Pr	12, 11, 14, 20, 13, 18, 16, 29, 21	2-cut Uniform Shelterwood	Sort Order (6), Pr>Pw and Pr+Pw>=Sw and Pr+Pw>=Sb and Pr+Pw>=Pj and Pr+Pw>=Qr and ((Pr+Pw*Stk>= 2 and (Pr+Pw+Pj+Sw+Sb+Qr)*Stk>= 25 and Stk>= 5) or (Pr+Pw+Pj+Sw+Sb+Qr>= 7))	PFT = PWR NDPEGFT = GLSL Pine
PR3	Plantation Red Pine	upland - red pine plantations primarily established on old fields	Pr	12	Row and Selective Thinning	Sort Order (3), Pr>= 5 and Pr>Pw and Stk>= 5 and Age<=50	PFT = PWR NDPEGFT = GLSL Pine
PW1	White Pine 3-cut	upland - well stocked pine stands dominated by white pine	Pw	11, 14, 20, 18, 21, 27, 17, 12, 24, 13, 34, 22, 30, 16, 23, 25, 28	3 or 4-cut Uniform Shelterwood	Sort Order (4), Pw>=Pr and Pw+Pr>=He and Pw+Pr>=Sw and Pw+Pr>=Qr and ((Pw+Pr>= 5 and Stk>= 7) or (Pw*Stk>= 3 and (Pw+Pr+He+Sw+Qr+Pj)*Stk>= 4 and Stk>= 7) or (Pr+Pw+He+Sw+Qr>= 7))	PFT = PWR NDPEGFT = GLSL Pine
PW2	White Pine 2-cut	upland - mixedwoods with a significant component of white pine	Pw	14, 11, 18, 20, 21, 17, 27, 22, 16, 25, 23, 24, 29, 30, 13, 35, 33	2-cut Uniform Shelterwood	Sort Order (5), Pw>=Pr and Pw+Pr>=He and Pw+Pr>=Sw and Pw+Pr>=Sb and Pw+Pr>=Pj and Pw+Pr>=Ce and Pw+Pr>=Qr and (Pw+Pr)*Stk>= 2 and (Pw+Pr+Pj+He+Sw+Sb+Ce+Qr)*Stk>= 25 and Stk>= 5	PFT = PWR NDPEGFT = GLSL Pine

[a] Provincial Forest Type [b] Natural Disturbance Pattern Emulation Guide Forest Type
Source: Table FMP-8 of 2006-2011 FMP for Ottawa Valley Forest

2008 Independent Forest Audit
Table 3 - Summary of Planned & Actual Harvest Volumes
Management Unit: Ottawa Valley Forest

Average Planned Annual Harvest Volumes

Volumes are Annualized for the indicated 5 year period

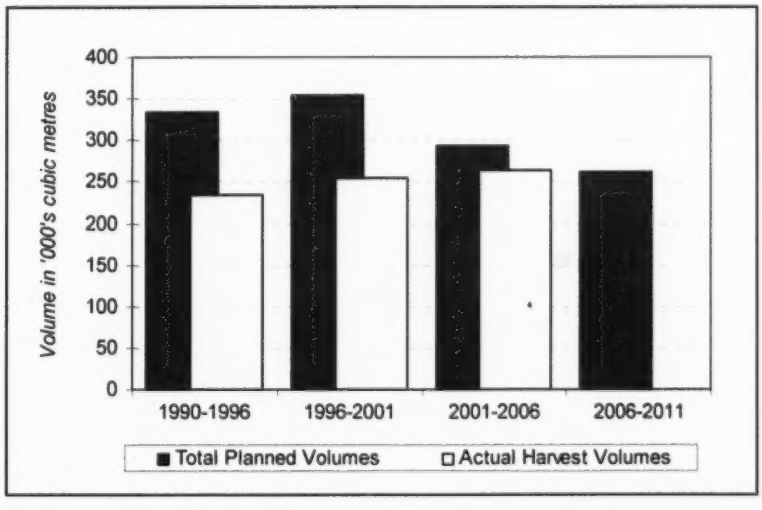
	Volume in '000's cubic metres			
	Past Plans			Current
Species	1990-1996	1996-2001	2001-2006**	2006-2011
Pw	45.3	35.1	62.3	49.9
Pr	9.4	12.8	20.9	15.2
Sp	6.5	10.8	9.8	9.3
Oc	21.1	52.0	22.1	19.7
M*	21.3	52.6	NA	39.3
Or	12.7	25.0	NA	16.0
Po	156.1	109.4	100.1	84.9
Bw	34.9	41.8	20.5	19.5
Oh	25.8	15.0	58.1	7.3
Total Planned Volumes	333.1	354.5	293.8	261.1

Actual Harvest Volumes
Volumes are Annualized for the indicated 5 year period

	Volume in '000's cubic metres			
	Past Plans			Current
Species	1990-1996	1996-2001	2001-2006**	2006-2011
Pw	42.1	38.4	66.2	
Pr	20.0	22.7	31.6	
Sp	7.8	8.4	8.28	
Oc	6.3	11.0	7.08	
M*	13.3	21.7	NA	
Or	10.6	16.1	NA	
Po	98.9	107.4	93.7	
Bw	14.2	18.1	13.1	
Oh	20.1	10.0	43.0	
Total Planned Volumes	233.4	253.8	263.0	

Source: 1990-1996, 1996-2001 — RPFO-4
2001-2006 — AR-4 2005-2006 (fifth year) annual report
2006-2011 — FMP-21

* M includes Mh and Mr
** The species classifications for hardwoods used in the FMP data management and analysis tools (SFMMTool and SFMM) were poorly aligned with the classifications in TREES. Comparisons of actual utilisation of hardwoods can only be made for poplar (all species), white birch and the aggregate of all hardwoods other than poplar and white birch (OH).

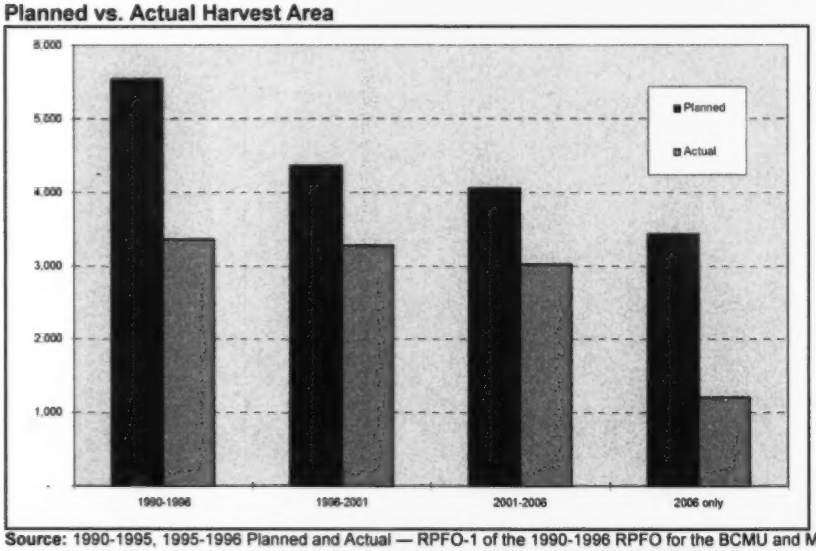


2008 Independent Forest Audit
Table 4 - Summary of Planned & Actual Depletion Area
Management Unit: Ottawa Valley Forest

Area is Annualized for the indicated 5 year period

	Planned Annual Harvest Area				Actual Depletion Area							
	Area in hectares				*Area in hectares*							
	Past Plans			Current	Past Plans						Current (2006 only)	
Forest Unit	1990-1996	1996-2001	2001-2006	2006-2011	1990-1996		1996-2001		2001-2006		2006-2011	
					Harvest	Natural	Harvest	Natural	Harvest	Natural	Harvest	Natural
CE	69				10	-						
M1A	445				273	-						
M1B	504				209	-						
M2/O2/O3/OH1/OH2/OH3	687				427	-						
M3	189				78	-						
MISC	248				118	-						
O1	85				43	-						
OC	113				63	-						
P1	239				205	-						
P2	493				304	-						
P3	454				424	-						
PB1	903				543	-						
PB2	1,095				659	-						
SP	23				5	-						
CLL		104					43	-				
CMX		169					100	4				
HPS		23					16	-				
MSC		51					54	2				
OAK		553					404	0				
PBC		495					401	2				
PBN		637					434	3				
PU2		307					242	1				
PU4		874					774	24				
SPW		13					9	-				
THE		262					193	-				
THU		870					597	-				
CE1			20	10					8	4	-	21
CM1			30	68					20	8	5	80
HD1			777	610					351	77	188	322
HE1			30	21					12	-	14	-
INT1			165	247					152	9	184	661
LH1			7	35					1	2	4	68
MW1			373	448					563	53	243	352
MW3			300	323					224	55	71	477
OC1			20	10					2	-	-	234
OR1			721	822					481	158	182	81
PJ1			20	20					8	-	4	154
PR1			120	100					157	2	108	350
PR3			114	18					31	1	8	1
PW1			980	662					976	76	163	2,092
PW2			375	230					29	47	32	363
	5,547	4,357	4,052	3,423	3,358	-	3,267	37	3,015	492	1,206	5,256

Planned vs. Actual Harvest Area



Source: 1990-1995, 1995-1996 Planned and Actual — RPFO-1 of the 1990-1996 RPFO for the BCMU and MCMU
1996-2001 - Planned, Actual and Natural (salvage) — RPFO-1 of the 1996-2001 RPFO
2001-2006 - Planned — Table FMP-18 of the 2001-2006 FMP; Actual and Natural — Table AR-1 and AR-6 of the 2005-2006 Annual Report
2006-2011 - Planned — Table FMP-18 of the 2006-2011 FMP; Actual and Natural — Table AR-1 and AR-6 respectively of the 2006-2007 Annual Report

2008 Independent Forest Audit
Table 5 - Summary of Managed Productive Forest by Forest Unit
Management Unit: Ottawa Valley Forest
Plan Term: 1990-1995 TMP and 1995-1996 Contingency Plan Combined

Forest Unit	Age Class	Protection Forest		Production Forest				
				Unavailable		Stage of Management	Available	
		(ha)	(m3)	(ha)	(m3)		(ha)	(m3)
P1	B&S	-		-			-	
P1	1-20	-		-			722	
P1	21-40	-		-			468	
P1	41-60	-		-			1,184	
P1	61-80	-		-			4,369	
P1	81-100	-		-			4,870	
P1	101-120	-		-			93	
P1	121+	-		-			-	
P1 Total		-		-			11,706	
P2	B&S	-		-			-	
P2	1-20	-		-			124	
P2	21-40	-		-			615	
P2	41-60	-		-			432	
P2	61-80	-		-			5,143	
P2	81-100	-		-			10,523	
P2	101-120	-		-			4,469	
P2	121+	-		-			310	
P2 Total		-		-			21,616	
P3	B&S	-		-			5,804	
P3	1-20	-		-			51	
P3	21-40	-		-			90	
P3	41-60	-		-			1,037	
P3	61-80	-		-			6,384	
P3	81-100	-		-			13,182	
P3	101-120	-		-			3,489	
P3	121+	-		-			340	
P3 Total		-		-			30,377	
P4 Total		721		-			-	
M1A	B&S	-		-			-	
M1A	1-20	-		-			-	
M1A	21-40	-		-			35	
M1A	41-60	-		-			189	
M1A	61-80	-		-			1,874	
M1A	81-100	-		-			2,694	
M1A	101-120	-		-			1,250	
M1A	121+	-		-			501	
M1A Total		-		-			6,543	
M1B	B&S	-		-			-	
M1B	1-20	-		-			-	
M1B	21-40	-		-			37	
M1B	41-60	-		-			141	
M1B	61-80	-		-			2,948	
M1B	81-100	-		-			3,396	
M1B	101-120	-		-			3,030	
M1B	121+	-		-			1,045	
M1B Total		-		-			10,597	
M2	B&S	-		-			8	
M2	1-20	-		-			-	
M2	21-40	-		-			-	
M2	41-60	-		-			85	
M2	61-80	-		-			780	
M2	81-100	-		-			495	
M2	101-120	-		-			1,604	
M2	121+	-		-			80	
M2 Total		-		-			3,052	
M3	B&S	-		-			892	
M3	1-20	-		-			-	
M3	21-40	-		-			-	
M3	41-60	-		-			21	
M3	61-80	-		-			798	
M3	81-100	-		-			1,765	
M3	101-120	-		-			450	
M3	121+	-		-			146	
M3 Total		-		-			4,072	

2008 Independent Forest Audit
Table 5 - Summary of Managed Productive Forest by Forest Unit
Management Unit: Ottawa Valley Forest
Plan Term: 1990-1995 TMP and 1995-1996 Contingency Plan Combined

Forest Unit	Age Class	Protection Forest		Production Forest				
				Unavailable		Stage of Management	Available	
		(ha)	(m3)	(ha)	(m3)		(ha)	(m3)
M4 Total		184		-			-	
O1	B&S	-		-			-	
O1	1-20	-		-			-	
O1	21-40	-		-			-	
O1	41-60	-		-			96	
O1	61-80	-		-			1,170	
O1	81-100	-		-			561	
O1	101-120	-		-			6	
O1	121+	-		-			-	
O1 Total		-		-			1,833	
O2	B&S	-		-			-	
O2	1-20	-		-			-	
O2	21-40	-		-			-	
O2	41-60	-		-			350	
O2	61-80	-		-			9,251	
O2	81-100	-		-			9,670	
O2	101-120	-		-			879	
O2	121+	-		-			43	
O2 Total		-		-			20,193	
O3	B&S	-		-			1,371	
O3	1-20	-		-			-	
O3	21-40	-		-			-	
O3	41-60	-		-			838	
O3	61-80	-		-			1,807	
O3	81-100	-		-			2,439	
O3	101-120	-		-			280	
O3	121+	-		-			-	
O3 Total		-		-			6,735	
O4 Total		3,137		-			-	
OH1	B&S	-		-			-	
OH1	1-20	-		-			-	
OH1	21-40	-		-			-	
OH1	41-60	-		-			130	
OH1	61-80	-		-			1,166	
OH1	81-100	-		-			373	
OH1	101-120	-		-			65	
OH1	121+	-		-			53	
OH1 Total		-		-			1,787	
OH2	B&S	-		-			-	
OH2	1-20	-		-			-	
OH2	21-40	-		-			-	
OH2	41-60	-		-			102	
OH2	61-80	-		-			2,244	
OH2	81-100	-		-			1,534	
OH2	101-120	-		-			508	
OH2	121+	-		-			69	
OH2 Total		-		-			4,457	
OH3	B&S	-		-			62	
OH3	1-20	-		-			-	
OH3	21-40	-		-			-	
OH3	41-60	-		-			61	
OH3	61-80	-		-			562	
OH3	81-100	-		-			549	
OH3	101-120	-		-			181	
OH3	121+	-		-			23	
OH3 Total		-		-			1,438	
OH4 Total		391		-			-	

2008 Independent Forest Audit
Table 5 - Summary of Managed Productive Forest by Forest Unit
Management Unit: Ottawa Valley Forest
Plan Term: 1990-1995 TMP and 1995-1996 Contingency Plan Combined

Forest Unit	Age Class	Protection Forest		Production Forest				
				Unavailable		Stage of Management	Available	
		(ha)	(m3)	(ha)	(m3)		(ha)	(m3)
PB1	B&S	-		-			5,383	
PB1	1-20	-		-			114	
PB1	21-40	-		-			1,088	
PB1	41-60	-		-			4,784	
PB1	61-80	-		-			20,154	
PB1	81-100	-		-			7,933	
PB1	101-120	-		-			1,023	
PB1	121+	-		-			190	
PB1 Total		-		-			40,669	
PB2	B&S	-		-			1,246	
PB2	1-20	-		-			-	
PB2	21-40	-		-			100	
PB2	41-60	-		-			6,209	
PB2	61-80	-		-			23,039	
PB2	81-100	-		-			6,903	
PB2	101-120	-		-			818	
PB2	121+	-		-			-	
PB2 Total		-		-			38,315	
PB4 Total		7,608		-			-	
SP	B&S	-		-			401	
SP	1-20	-		-			18	
SP	21-40	-		-			43	
SP	41-60	-		-			13	
SP	61-80	-		-			97	
SP	81-100	-		-			835	
SP	101-120	-		-			522	
SP	121+	-		-			42	
SP Total		-		-			1,971	
CE	B&S	-		-			254	
CE	1-20	-		-			-	
CE	21-40	-		-			28	
CE	41-60	-		-			-	
CE	61-80	-		-			345	
CE	81-100	-		-			1,693	
CE	101-120	-		-			1,312	
CE	121+	-		-			462	
CE Total		-		-			4,094	
CE4 Total		9		-			-	
OC	B&S	-		-			478	
OC	1-20	-		-			-	
OC	21-40	-		-			174	
OC	41-60	-		-			675	
OC	61-80	-		-			2,546	
OC	81-100	-		-			2,532	
OC	101-120	-		-			820	
OC	121+	-		-			259	
OC Total		-		-			7,484	
OC4 Total		246		-			-	
MISC	B&S	-		-			-	
MISC	1-20	-		-			-	
MISC	21-40	-		-			-	
MISC	41-60	-		-			410	
MISC	61-80	-		-			3,191	
MISC	81-100	-		-			1,488	
MISC	101-120	-		-			769	
MISC	121+	-		-			137	
MISC Total		-		-			5,995	
MISC4 Total		193		-			-	
Grand Total		12,489		-			222,934	

Source: Tables 20, 21 1990-1995 TMP for BCMU and MCMU

2008 Independent Forest Audit
Table 5 - Summary of Managed Productive Forest by Forest Unit
Management Unit: Otttawa Valley Forest
Plan Term: April 1, 1996 to March 31, 2001

Forest Unit	Age Class	Protection Forest		Production Forest				
				Unavailable		Stage of Management	Available	
		(ha)	(m3)	(ha)	(m3)		(ha)	(m3)
PU4	B&S						-	
PU4	1-20						1,579	
PU4	21-40						1,329	
PU4	41-60						2,057	
PU4	61-80						5,554	
PU4	81-100						17,079	
PU4	101-120						7,861	
PU4	121+						440	
PU4 Total							35,899	
PU2	B&S						3,709	
PU2	1-20						81	
PU2	21-40						682	
PU2	41-60						1,384	
PU2	61-80						4,645	
PU2	81-100						12,557	
PU2	101-120						5,560	
PU2	121+						407	
PU2 Total							29,025	
THE	B&S						-	
THE	1-20						3	
THE	21-40						337	
THE	41-60						2,904	
THE	61-80						3,863	
THE	81-100						5,796	
THE	101-120						1,071	
THE	121+						1,177	
THE Total							15,151	
OAK	B&S						-	
OAK	1-20						-	
OAK	21-40						140	
OAK	41-60						1,506	
OAK	61-80						10,364	
OAK	81-100						13,513	
OAK	101-120						1,474	
OAK	121+						-	
OAK Total							26,997	
SPW	B&S						262	
SPW	1-20						3	
SPW	21-40						25	
SPW	41-60						61	
SPW	61-80						517	
SPW	81-100						345	
SPW	101-120						12	
SPW	121+						-	
SPW Total							1,225	
CLL	B&S						333	
CLL	1-20						11	
CLL	21-40						37	
CLL	41-60						414	
CLL	61-80						1,344	
CLL	81-100						2,174	
CLL	101-120						2,754	
CLL	121+						488	
CLL Total							7,555	

2008 Independent Forest Audit
Table 5 - Summary of Managed Productive Forest by Forest Unit
Management Unit: Otttawa Valley Forest
Plan Term: April 1, 1996 to March 31, 2001

Forest Unit	Age Class	Protection Forest		Production Forest				
				Unavailable		Stage of Management	Available	
		(ha)	(m3)	(ha)	(m3)		(ha)	(m3)
PBN	B&S						3,482	
PBN	1-20						71	
PBN	21-40						2,663	
PBN	41-60						8,495	
PBN	61-80						12,152	
PBN	81-100						7,254	
PBN	101-120						1,049	
PBN	121+						12	
PBN Total							35,178	
PBC	B&S						1,995	
PBC	1-20						6	
PBC	21-40						234	
PBC	41-60						2,887	
PBC	61-80						8,480	
PBC	81-100						5,030	
PBC	101-120						1,100	
PBC	121+						-	
PBC Total							19,732	
THU	B&S						-	
THU	1-20						-	
THU	21-40						243	
THU	41-60						1,768	
THU	61-80						3,409	
THU	81-100						10,857	
THU	101-120						2,156	
THU	121+						273	
THU Total							18,706	
HPS	B&S						494	
HPS	1-20						-	
HPS	21-40						9	
HPS	41-60						219	
HPS	61-80						561	
HPS	81-100						976	
HPS	101-120						408	
HPS	121+						216	
HPS Total							2,883	
CMX	B&S						223	
CMX	1-20						41	
CMX	21-40						165	
CMX	41-60						1,435	
CMX	61-80						3,222	
CMX	81-100						1,976	
CMX	101-120						387	
CMX	121+						18	
CMX Total							7,467	
MSC	B&S						-	
MSC	1-20						-	
MSC	21-40						101	
MSC	41-60						216	
MSC	61-80						307	
MSC	81-100						507	
MSC	101-120						196	
MSC	121+						-	
MSC Total							1,327	
Grand Total 4.13.2		23,262					201,145	
Grand Total 4.8.1		1,440					222,967	

Derived by subtracting *REVISED* MAD Landbase (4.13.2) from sum of Protection Forest and Productive Forest in table 4.8.1.
Note that this is a non-spatial estimate of Protection Forest based on planning team assumptions.

Source: *DERIVED* fromTables 4.13.2 and 4.8.1 of the 1996-2001 TMP for PCMU

2008 Independent Forest Audit
Table 5 - Summary of Managed Productive Forest by Forest Unit
Management Unit: Ottawa Valley Forest
Plan Term: April 1, 2001 to March 31, 2006

Forest Unit	Age Class	Protection Forest		Production Forest				
				Unavailable			Available	
		Area (ha)	Volume (m^3)	Area (ha)	Volume (m^3)	Stage of Management	Area (ha)	Volume (m^3)
CE1	B_N_S	-	-			NA	180.8	-
	21-40	-	-			NA	16.2	-
	41-60	-	-			NA	50.3	2,508
	61-80	-	-			NA	246.7	17,589
	81-100	-	-			NA	833.5	94,331
	101-120	-	-			NA	1,493.0	158,302
	121-140	16.5	1,735			NA	1,595.2	167,672
	141-160	-	-			NA	107.5	10,051
	161-180	-	-			NA	33.8	1,860
CE1 Subtotal		16.5	1,735				4,556.9	452,313
CM1	B_N_S	-	-			NA	377.4	-
	1-20	-	-			NA	21.5	-
	21-40	-	-			NA	29.8	164
	41-60	-	-			NA	239.9	19,623
	61-80	-	-			NA	1,368.7	140,669
	81-100	-	-			NA	714.8	92,498
	101-120	-	-			NA	739.5	88,683
	121-140	-	-			NA	64.4	4,793
CM1 Subtotal		-	-				3,555.9	346,430
HD1 Subtotal		30.8	4,372				25,503.8	3,222,757
HE1	41-60	-	-			SEED CUT	113.8	5,923
	61-80	-	-			SEED CUT	156.9	13,338
	81-100	-	-			SEED CUT	47.6	8,228
	81-100	-	-			FIRST REMOVAL	92.8	9,184
	101-120	12.9	2,155			NA	-	-
	101-120	-	-			SEED CUT	115.0	19,213
	101-120	-	-			FIRST REMOVAL	201.3	22,429
	121-140	-	-			SEED CUT	566.4	82,407
	121-140	-	-			FIRST REMOVAL	214.8	26,461
	121-140	-	-			FINAL REMOVAL	14.1	1,005
	141-160	-	-			SEED CUT	520.6	81,533
	141-160	-	-			FIRST REMOVAL	90.2	9,679
	161-180	-	-			SEED CUT	14.1	2,124
	201-220	-	-			SEED CUT	1.7	260
HE1 Subtotal		12.9	2,155				2,149.1	281,783
INT1	B_N_S	-	-			NA	10,904.3	-
	1-20	-	-			NA	674.8	2,003
	21-40	-	-			NA	751.3	32,114
	41-60	14.7	1,903			NA	2,476.1	320,593
	61-80	23.4	3,614			NA	6,372.5	985,102
	81-100	11.2	1,709			NA	2,879.5	438,064
	101-120	-	-			NA	652.0	88,628
INT1 Subtotal		49.3	7,226				24,710.5	1,866,504
LH1 Subtotal		37.7	3,119				1,634.0	102,239
MW1	B_N_S	-	-			NA	208.8	-
	1-20	-	-			NA	9.2	-
	21-40	-	-			NA	931.4	28,143
	41-60	29.0	2,318			NA	3,670.2	293,384
	61-80	87.0	9,523			NA	11,009.1	1,204,519
	81-100	57.1	6,588			NA	10,557.5	1,218,744
	101-120	52.2	5,748			NA	3,228.2	355,404
	121-140	-	-			NA	221.6	27,112
MW1 Subtotal		225.3	24,177				29,836.1	3,127,306

2008 Independent Forest Audit
Table 5 - Summary of Managed Productive Forest by Forest Unit
Management Unit: Ottawa Valley Forest
Plan Term: April 1, 2001 to March 31, 2006

Forest Unit	Age Class	Protection Forest		Production Forest				
				Unavailable		Stage of Management	Available	
		Area (ha)	Volume (m^3)	Area (ha)	Volume (m^3)		Area (ha)	Volume (m^3)
MW3	21-40	-	-			NA	969.3	29,559
	41-60	-	-			NA	2,290.7	221,211
	61-80	25.7	3,341			NA	7,210.6	937,769
	81-100	19.2	2,396			NA	8,186.7	1,023,794
	101-120	-	-			NA	4,817.3	597,114
	121-140	-	-			NA	459.4	44,856
MW3 Subtotal		44.9	5,737				23,934.0	2,854,303
OC1	B_N_S	-	-			NA	139.5	-
	1-20	-	-			NA	0.3	-
	41-60	-	-			NA	163.9	8,992
	61-80	-	-			NA	667.7	53,150
	81-100	-	-			NA	728.9	62,941
	101-120	29.2	2,760			NA	1,007.9	95,308
	121-140	-	-			NA	170.7	16,350
OC1 Subtotal		29.2	2,760				2,879.0	236,741
OR1	B_N_S	-	-			NA	97.7	-
	21-40	46.5	1,769			NA	-	-
	21-40	-	-			PREP CUT	48.1	1,828
	41-60	71.0	5,363			NA	-	-
	41-60	-	-			PREP CUT	1,345.0	101,604
	61-80	150.0	16,108			NA	-	-
	61-80	-	-			PREP CUT	10,605.0	1,139,005
	81-100	326.3	45,444			NA	-	-
	81-100	-	-			SEED CUT	18,066.4	2,516,263
	81-100	-	-			FIRST REMOVAL	1,585.7	166,536
	101-120	237.2	36,348			NA	-	-
	101-120	-	-			SEED CUT	2,278.4	349,134
	101-120	-	-			FIRST REMOVAL	694.3	70,360
	101-120	-	-			FINAL REMOVAL	202.9	14,190
	121-140	-	-			SEED CUT	95.5	17,503
	121-140	-	-			FIRST REMOVAL	16.1	1,926
	121-140	-	-			FINAL REMOVAL	16.2	1,700
OR1 Subtotal		831.0	105,033				35,051.3	4,380,048
PJ1	B_N_S	-	-			NA	112.2	-
	1-20	-	-			NA	1.9	4
	21-40	-	-			NA	108.2	7,377
	41-60	-	-			NA	349.8	41,667
	61-80	-	-			NA	453.1	49,288
	81-100	-	-			NA	605.5	71,165
	101-120	-	-			NA	187.7	21,006
PJ1 Subtotal		-	-				1,818.4	190,507
PR1	B_N_S	-	-			NA	184.0	-
	21-40	-	-			SEED CUT	24.9	693
	41-60	-	-			SEED CUT	270.1	39,680
	61-80	-	-			SEED CUT	929.0	183,755
	81-100	-	-			SEED CUT	1,720.2	341,482
	81-100	-	-			FINAL REMOVAL	95.7	11,926
	101-120	-	-			SEED CUT	1,565.7	321,825
	101-120	-	-			FINAL REMOVAL	160.1	19,636
	121-140	-	-			SEED CUT	67.9	11,977
	121-140	-	-			FINAL REMOVAL	14.1	1,732
PR1 Subtotal		-	-				5,031.7	932,707
PR3	1-20	-	-			COMMERCIAL THINNING	84.7	2,326
	21-40	-	-			COMMERCIAL THINNING	1,817.7	136,609
	41-60	-	-			COMMERCIAL THINNING	271.5	41,715
PR3 Subtotal		-	-				2,174.0	180,649

2008 Independent Forest Audit
Table 5 - Summary of Managed Productive Forest by Forest Unit
Management Unit: Ottawa Valley Forest
Plan Term: April 1, 2001 to March 31, 2006

Forest Unit	Age Class	Protection Forest		Production Forest				
				Unavailable		Stage of Management	Available	
		Area (ha)	Volume (m^3)	Area (ha)	Volume (m^3)		Area (ha)	Volume (m^3)
PW1	B_N_S	-	-			NA	2,045.4	-
	1-20	-	-			PREP CUT	739.0	59
	21-40	-	-			PREP CUT	679.5	11,822
	41-60	-	-			PREP CUT	1,400.5	163,983
	61-80	-	-			PREP CUT	5,485.3	787,263
	81-100	11.1	1,850			NA	-	-
	81-100	-	-			SEED CUT	11,996.1	1,993,005
	81-100	-	-			FIRST REMOVAL	2,256.1	342,336
	101-120	71.2	16,108			NA	-	-
	101-120	-	-			SEED CUT	5,716.0	1,292,355
	101-120	-	-			FIRST REMOVAL	3,921.2	645,740
	101-120	-	-			FINAL REMOVAL	2,072.0	219,037
	121-140	-	-			SEED CUT	406.5	88,268
	121-140	-	-			FIRST REMOVAL	330.9	46,288
	121-140	-	-			FINAL REMOVAL	66.9	7,758
PW1 Subtotal		82.4	17,957				37,115.4	5,597,914
PW2	21-40	-	-			SEED CUT	102.3	2,931
	41-60	-	-			SEED CUT	779.3	76,036
	61-80	-	-			SEED CUT	2,712.4	373,363
	81-100	-	-			SEED CUT	5,706.5	884,587
	101-120	-	-			SEED CUT	5,436.3	842,710
	121-140	-	-			SEED CUT	566.9	67,346
	141-160	-	-			SEED CUT	50.2	5,524
	161-180	-	-			SEED CUT	32.4	3,952
PW2 Subtotal		-	-				15,386.3	2,256,449
Grand Subtotal		1,359.9	174,272				215,336.5	26,028,649

Source : Table FMP-9 of the 2001-2006 FMP for Ottawa Valley Forest

2008 Independent Forest Audit
Table 5 - Summary of Managed Productive Forest by Forest Unit
Management Unit: Ottawa Valley Forest
Plan Term: April 1, 2001 to March 31, 2006

Forest Unit	Age Class	Protection Forest		Production Forest				
				Unavailable			Available	
		Area (ha)	Volume (m3)	Area (ha)	Volume (m3)	Stage of Management	Area (ha)	Volume (m3)
CE1	0	-	-	-	-	B_N_S or DEPLETED	159.1	-
CE1	1-20	-	-	11	-	STRIP CLEARCUT	3.9	-
CE1	41-60	-	-	-	-	STRIP CLEARCUT	16.6	416
CE1	61-80	-	-	9	600	STRIP CLEARCUT	102.1	7,192
CE1	81-100	2.1	185	35	3,199	STRIP CLEARCUT	387.2	36,114
CE1	101-120	0.7	75	93	10,002	STRIP CLEARCUT	947.0	102,495
CE1	121+	16.5	1,482	278	26,878	STRIP CLEARCUT	2,655.4	255,467
CE1 Total		19	1,742	425	40,679	-	4,271	401,683
CM1	0	-	-	-	-	B_N_S or DEPLETED	311.1	-
CM1	1-20	-	-	52	-	CLEARCUT	28.8	-
CM1	21-40	-	-	8	177	CLEARCUT	47.6	946
CM1	41-60	-	-	1	47	CLEARCUT	102.9	5,384
CM1	61-80	-	-	70	6,383	CLEARCUT	491.1	44,266
CM1	81-100	-	-	210	22,144	CLEARCUT	1,118.8	117,573
CM1	101-120	-	-	195	22,279	CLEARCUT	695.0	79,224
CM1	121+	-	-	43	4,254	CLEARCUT	273.9	27,019
CM1 Total		-	-	579	55,284	-	3,069	274,413
HD1	0	-	-	-	-	B_N_S or DEPLETED	65.9	-
HD1	UEA	30.9	4,412	1,113	150,162	SELECTION	24,407.9	3,283,587
HD1 Total		31	4,412	1,113	150,162	-	24,474	3,283,587
HE1	0	-	-	-	-	B_N_S or DEPLETED	9.6	-
HE1	1-20	-	-	-	-	REGENERATION CUT	14.6	-
HE1	21-40	-	-	2	2	REGENERATION CUT	30.7	31
HE1	41-60	-	-	-	-	REGENERATION CUT	5.6	269
HE1	61-80	-	-	10	1,016	REGENERATION CUT	164.0	14,752
HE1	61-80	-	-	-	-	FIRST REMOVAL	105.3	6,252
HE1	81-100	-	-	3	412	REGENERATION CUT	86.6	10,656
HE1	81-100	-	-	-	-	FIRST REMOVAL	37.4	3,250
HE1	81-100	-	-	-	-	FINAL REMOVAL	26.0	1,126
HE1	101-120	12.9	2,104	4	665	REGENERATION CUT	53.7	8,696
HE1	101-120	-	-	-	-	FIRST REMOVAL	56.9	6,037
HE1	101-120	-	-	-	-	FINAL REMOVAL	46.2	2,439
HE1	121+	-	-	136	22,215	REGENERATION CUT	1,084.9	177,082
HE1	121+	-	-	-	-	FIRST REMOVAL	346.3	38,773
HE1	121+	-	-	-	-	FINAL REMOVAL	25.6	1,485
HE1 Total		13	2,104	156	24,309	-	2,093	270,848
INT1	0	-	-	-	-	B_N_S or DEPLETED	5,389.5	-
INT1	1-20	-	-	676	-	CLEARCUT	2,537.2	-
INT1	21-40	-	-	69	1,343	CLEARCUT	577.5	13,729
INT1	41-60	-	-	91	9,096	CLEARCUT	943.4	95,857
INT1	61-80	15.8	2,364	410	63,277	CLEARCUT	3,961.8	615,739
INT1	81-100	101.8	18,111	427	74,227	CLEARCUT	5,013.5	872,289
INT1	101-120	-	-	203	35,023	CLEARCUT	1,861.1	323,554
INT1	121+	-	-	31	3,090	CLEARCUT	173.9	17,503
INT1 Total		118	20,474	1,906	186,056	-	20,458	1,938,672
LH1	0	-	-	-	-	B_N_S or DEPLETED	13.7	-
LH1	UEA	52.9	5,641	118	11,508	SELECTION	1,690.1	161,970
LH1 Total		53	5,641	118	11,508	-	1,704	161,970
MW1	0	-	-	-	-	B_N_S or DEPLETED	58.1	-
MW1	1-20	-	-	72	-	CLEARCUT	632.1	-
MW1	21-40	-	-	14	125	CLEARCUT	417.5	3,888
MW1	41-60	-	-	145	9,424	CLEARCUT	1,706.5	106,723
MW1	61-80	55.4	5,659	598	59,499	CLEARCUT	5,810.1	581,656
MW1	81-100	103.7	12,521	1,319	160,407	CLEARCUT	9,955.8	1,207,212
MW1	101-120	27.3	3,492	928	119,082	CLEARCUT	7,674.6	984,324
MW1	121+	-	-	147	13,904	CLEARCUT	1,424.3	136,316
MW1 Total		186	21,671	3,223	362,442	-	27,679	3,020,118
MW3	0	-	-	-	-	B_N_S or DEPLETED	90.5	-
MW3	1-20	-	-	34	-	CLEARCUT WITH SEED TREES	432.1	-
MW3	21-40	-	-	15	118	CLEARCUT WITH SEED TREES	233.7	2,757
MW3	41-60	-	-	232	15,648	CLEARCUT WITH SEED TREES	1,304.7	88,310
MW3	61-80	13.2	1,560	377	42,427	CLEARCUT WITH SEED TREES	3,149.3	354,174
MW3	81-100	15.9	2,115	920	123,649	CLEARCUT WITH SEED TREES	5,441.8	728,577
MW3	101-120	11.7	1,705	978	139,877	CLEARCUT WITH SEED TREES	7,311.9	1,044,678
MW3	121+	-	-	318	33,561	CLEARCUT WITH SEED TREES	2,201.7	240,013
MW3 Total		41	5,380	2,874	355,281	-	20,166	2,458,509

2008 Independent Forest Audit
Table 5 - Summary of Managed Productive Forest by Forest Unit
Management Unit: Ottawa Valley Forest
Plan Term: April 1, 2001 to March 31, 2006

Forest Unit	Age Class	Protection Forest		Production Forest				
				Unavailable		Stage of Management	Available	
		Area (ha)	Volume (m3)	Area (ha)	Volume (m3)		Area (ha)	Volume (m3)
OC1	0	-	-	-	-	B_N_S or DEPLETED	114.6	-
OC1	1-20	-	-	19	-	STRIP CLEARCUT	6.3	-
OC1	21-40	-	-	0	1	STRIP CLEARCUT	7.7	46
OC1	41-60	-	-	2	55	STRIP CLEARCUT	55.6	1,810
OC1	61-80	-	-	34	2,006	STRIP CLEARCUT	188.2	10,916
OC1	81-100	4.1	313	107	8,403	STRIP CLEARCUT	646.3	51,827
OC1	101-120	41.0	4,032	168	16,239	STRIP CLEARCUT	1,030.7	100,377
OC1	121+	-	-	79	7,460	STRIP CLEARCUT	321.6	30,626
OC1 Total		45	4,345	407	34,164	-	2,371	195,603
OR1	0	-	-	-	-	B_N_S or DEPLETED	121.2	-
OR1	1-20	-	-	13	-	REGENERATION CUT	-	-
OR1	21-40	20.6	62	1	14	REGENERATION CUT	12.8	164
OR1	41-60	46.6	2,488	14	840	REGENERATION CUT	178.4	9,095
OR1	41-60	-	-	-	-	FINAL REMOVAL	213.3	3,528
OR1	61-80	79.1	7,522	224	23,902	REGENERATION CUT	2,309.2	253,445
OR1	61-80	-	-	-	-	FIRST REMOVAL	631.5	42,949
OR1	61-80	-	-	-	-	FINAL REMOVAL	437.1	13,437
OR1	81-100	226.5	33,723	887	130,989	REGENERATION CUT	10,280.9	1,520,430
OR1	81-100	-	-	-	-	FIRST REMOVAL	2,476.3	238,848
OR1	81-100	-	-	-	-	FINAL REMOVAL	320.6	13,371
OR1	101-120	441.3	75,928	770	132,077	REGENERATION CUT	11,974.6	2,051,433
OR1	101-120	-	-	-	-	FIRST REMOVAL	2,661.1	296,684
OR1	101-120	-	-	-	-	FINAL REMOVAL	436.8	23,348
OR1	121+	82.4	13,617	72	11,762	REGENERATION CUT	906.7	148,783
OR1	121+	-	-	-	-	FIRST REMOVAL	289.6	32,913
OR1	121+	-	-	-	-	FINAL REMOVAL	92.4	5,164
OR1 Total		897	133,339	1,981	299,584	-	33,343	4,653,590
PJ1	0	-	-	-	-	B_N_S or DEPLETED	178.1	-
PJ1	1-20	-	-	11	-	CLEARCUT	28.6	-
PJ1	21-40	-	-	1	34	CLEARCUT	17.9	766
PJ1	41-60	-	-	17	1,303	CLEARCUT	109.4	9,117
PJ1	61-80	-	-	68	7,637	CLEARCUT	377.5	42,393
PJ1	81-100	-	-	93	11,880	CLEARCUT	426.6	54,776
PJ1	101-120	-	-	72	9,164	CLEARCUT	385.0	47,987
PJ1	121+	-	-	0	16	CLEARCUT	31.3	2,548
PJ1 Total		-	-	262	30,035	-	1,554	157,587
PR1	0	-	-	-	-	B_N_S or DEPLETED	594.9	-
PR1	1-20	-	-	25	7	REGENERATION CUT	325.4	325
PR1	21-40	-	-	16	370	REGENERATION CUT	123.2	3,121
PR1	41-60	-	-	9	969	REGENERATION CUT	300.5	36,682
PR1	41-60	-	-	-	-	FINAL REMOVAL	6.7	431
PR1	61-80	-	-	43	7,413	REGENERATION CUT	448.7	77,927
PR1	61-80	-	-	-	-	FINAL REMOVAL	226.4	19,081
PR1	81-100	-	-	92	18,661	REGENERATION CUT	892.9	181,585
PR1	81-100	-	-	-	-	FINAL REMOVAL	253.5	25,072
PR1	101-120	-	-	121	25,512	REGENERATION CUT	1,376.1	291,305
PR1	101-120	-	-	-	-	FINAL REMOVAL	327.2	34,184
PR1	121+	-	-	102	20,593	REGENERATION CUT	970.2	195,406
PR1	121+	-	-	-	-	FINAL REMOVAL	348.8	37,423
PR1 Total		-	-	406	73,525	-	6,195	902,542
PR3	21-40	-	-	37	2,590	COMMERCIAL THINNING	384.9	1,603
PR3	41-60	-	-	71	9,585	COMMERCIAL THINNING	1,071.7	-
PR3	61-80	-	-	1	286	COMMERCIAL THINNING	41.8	-
PR3 Total		-	-	109	12,461	-	1,498	1,603

2008 Independent Forest Audit
Table 5 - Summary of Managed Productive Forest by Forest Unit
Management Unit: Ottawa Valley Forest
Plan Term: April 1, 2001 to March 31, 2006

Forest Unit	Age Class	Protection Forest		Production Forest				
				Unavailable		Stage of Management	Available	
		Area (ha)	Volume (m3)	Area (ha)	Volume (m3)		Area (ha)	Volume (m3)
PW1	0	-	-	-	-	B_N_S or DEPLETED	2,924.1	-
PW1	1-20	-	-	275	-	REGENERATION CUT	1,367.6	-
PW1	21-40	-	-	81	2,434	REGENERATION CUT	1,536.9	50,231
PW1	41-60	-	-	49	4,306	REGENERATION CUT	634.1	57,716
PW1	41-60	-	-	-	-	FIRST REMOVAL	42.1	2,832
PW1	41-60	-	-	-	-	FINAL REMOVAL	31.7	1,189
PW1	61-80	-	-	285	44,089	REGENERATION CUT	2,537.2	392,575
PW1	61-80	-	-	-	-	FIRST REMOVAL	571.3	58,947
PW1	61-80	-	-	-	-	FINAL REMOVAL	418.4	25,221
PW1	81-100	3.8	794	778	156,340	REGENERATION CUT	3,926.4	781,257
PW1	81-100	-	-	-	-	FIRST REMOVAL	3,263.8	430,130
PW1	81-100	-	-	-	-	FINAL REMOVAL	803.5	59,556
PW1	101-120	46.8	10,708	1,471	334,273	REGENERATION CUT	6,440.4	1,460,446
PW1	101-120	-	-	-	-	FIRST REMOVAL	4,701.0	705,314
PW1	101-120	-	-	-	-	FINAL REMOVAL	1,632.1	137,946
PW1	121+	36.8	8,444	646	148,523	REGENERATION CUT	1,941.5	446,569
PW1	121+	-	-	-	-	FIRST REMOVAL	2,293.1	363,086
PW1	121+	-	-	-	-	FINAL REMOVAL	1,083.5	95,547
PW1 Total		87	19,946	3,584	689,964	-	36,149	5,068,562
PW2	1-20	-	-	12	-	REGENERATION CUT	320.4	-
PW2	21-40	-	-	-	-	REGENERATION CUT	111.7	1,171
PW2	41-60	-	-	22	1,476	REGENERATION CUT	207.7	14,073
PW2	61-80	-	-	77	8,917	REGENERATION CUT	1,065.6	122,927
PW2	61-80	-	-	-	-	FINAL REMOVAL	11.4	503
PW2	81-100	-	-	235	33,476	REGENERATION CUT	2,572.1	364,939
PW2	81-100	-	-	-	-	FINAL REMOVAL	34.3	2,182
PW2	101-120	-	-	727	112,050	REGENERATION CUT	5,905.2	911,347
PW2	101-120	-	-	-	-	FINAL REMOVAL	41.5	3,011
PW2	121+	-	-	420	54,560	REGENERATION CUT	2,303.8	314,475
PW2	121+	-	-	-	-	FINAL REMOVAL	31.1	2,364
PW2 Total		-	-	1,494	210,479	-	12,605	1,736,992
Grand Total		1,490	219,056	18,636	2,535,934	-	197,628	24,526,279

Source : Table FMP-9 of the 2001-2006 FMP for Ottawa Valley Forest

2008 Independent Forest Audit
Table 6 SUMMARY REPORT OF RENEWAL, TENDING AND PROTECTION OPERATIONS
Management Unit: Ottawa Valley Forest

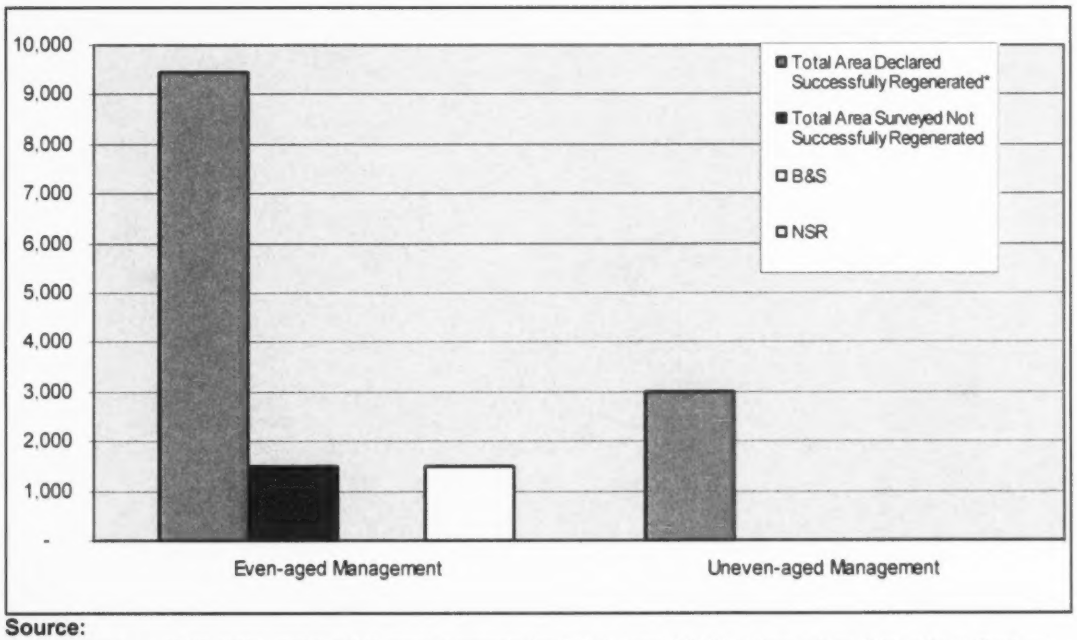
	Area Summary of all Forest Units (ha)						
	1990-1996		1996-2001		2001-2006		2006-
	Forecast	Actual	Forecast	Actual	Forecast	Actual	Forecast
Renewal							
Regeneration							
Natural							
Clearcut Silvicultural System (even-aged)							
Block Cut	6,219	1,890	5,049	2,356	2,578	3,714	3,337
Strip Cut	233	-	-	-	200	49	100
Seed Tree Cut	-	-	-	303	873	1,021	1,242
HARP/HARO/CLAAG	-	-	-	-	-	-	-
Shelterwood Silvicultural System (even-aged)							
Uniform Shelterwood Seed Cut	6,813	5,727	1,515	5,486	8,007	4,795	6,259
Strip Shelterwood Seed Cut	-	-	-	-	-	-	-
Selection Silvicultural System - Selection Harvest (uneven-aged)	6,881	4,071	4,370	2,702	3,920	1,757	3,132
Subtotal Natural	20,146	11,688	10,934	10,847	15,577	11,337	14,070
Artificial							
Planting	7,081	2,557	4,201	1,715	-	-	-
Seeding	-	75	140	-	29	-	-
Subtotal Artificial	7,081	2,632	4,341	1,715	29	-	-
Total Regeneration	27,227	14,320	15,275	12,562	15,606	11,337	14,070
Artificial - Retreatment**							
Planting	-	-	-	-	1,209	1,421	220
Seeding	-	-	-	-	-	-	-
Total Re-treatment	-	-	-	-	1,209	1,421	220
Artificial - Supplemental**							
Planting	-	-	-	266	1,806	2,100	2,355
Seeding	-	-	-	-	-	-	-
Total Supplemental Treatments	-	-	-	266	1,806	2,100	2,355
Site Preparation							
Mechanical	9,516	3,958	11,735	5,745	4,331	2,291	2,733
Chemical aerial	-	-	-	-	-	-	-
ground	1	30	350	181	2,160	319	1,890
Prescribed Burn	1,929	34	1,213	33	-	-	-
Total Site Preparation	11,446	4,022	13,298	5,959	6,491	2,610	4,623
Tending							
Cleaning							
Manual	599	248	1,055	1,611	658	965	623
Chemical aerial	1,610	16	2,830	2,369	502	-	-
ground	3,406	1,474	14,381	2,098	3,246	3,569	2,756
Mechanical	-	7	-	-	-	-	-
Prescribed Burn	-	-	-	-	-	-	-
Spacing, pre-commercial thinning, improvement cutting							
Even-aged	17,161	9,317	9,836	3,113	4,951	2,787	750
Uneven-aged	3,679	708	4,827	2,922	3,887	896	475
Other							
Cultivation	-	-	-	40	-	6	-
Pruning	-	-	-	-	-	-	-
Total Tending	26,455	11,770	32,929	12,153	13,244	8,224	4,604
Protection							
Harvest		-		-		-	
Manual		-		-		-	
Ground Insecticide		16		-		-	
Aerial Insecticide		-		-		-	
		-		-		-	
Total Protection		16		-		-	

* 2006 only
** Distinction between original, supplemental and retreatment regeneration began in 2000-2001 Annual Report.

2008 Independent Forest Audit
Table 7 - Harvested Area Successfully Regenerated - Summary of All Forest Units
Management Unit: Ottawa Valley Forest

	AREA IN HECTARES (All Forest Units Combined)	***AREA IN HECTARES (All Forest Units Combined)***
	Even-aged Management	**Uneven-aged Management**
Total Area Harvested	13,507	3,005
Total Area Surveyed for Regeneration Success	5,809	-
Total Unsurveyed Area	7,698	3,005
*Total Area Declared Successfully Regenerated**	9,462	3,005
Total Area Surveyed Not Successfully Regenerated	1,514	-
NSR	1,514	-
B&S	-	-
Not Available for Regen. (eg. Roads & landings)	-	-
Other	-	-
Percent of Area Surveyed Declared Successfully Regenerated	73.9%	

* E/A includes 4,295 ha surveyed area declared FTG plus 5,167 ha that was not renewal harvest (i.e. Still stocked)
UE/A still stocked, assumed perpetually FTG



Source:
harvest area — 1993-1994, 1994-1995 annual reports for BCMU and MCMU 'Harvest by Silvicultural System'
harvest area — 1995-1996 RPFO-1 for 1995-1996 Contingency Plan for BCMU and MCMU
harvest area — 1996-1997,1997-1998 annual reports for PCMU table AR-1
survey results — 1996-2007 annual reports tables AR-9 and AR-14, silviculture and survey records

APPENDIX B – AUDIT TEAM MEMBERS AND QUALIFICATIONS

Name	Role	Responsibilities	Credentials
Mr. Rod Seabrook	Lead Auditor Wildlife/Ecology Auditor	Overall audit coordination and oversight of activities of the audit team; review of management objectives, contractual obligations, and forest sustainability; inspect AOC documentation and practices; audit aspects of forest management related to environmental protection and wildlife practices.	M.Sc.Biology; 28 years forestry experience in Ontario; auditor on 19 independent forest audits (14 as lead auditor); over 50 ISO 14001 audits & over 25 sustainable forest management system audits in Canada and the United States; certified environmental auditor (sustainable forest management) and environmental management system lead auditor.
Mr. Laird Van Damme	Harvest Auditor	Assess access and harvest planning and implementation; review compliance program planning and implementation; assist in assessment of achievement of management objectives and forest sustainability.	R.P.F., M.Sc.F.; 22 years experience as a practising forester, educator and consultant; primary areas of practice are silviculture, forest management and forest research; completed five-day ISO 14001 EMS Lead Auditor training course; worked on 15 previous Independent Forest Audits as either Lead, Harvest or Planning Auditor.
Mr. Brad Chaulk	Planning Auditor	Audit forest management planning requirements; assist in assessment of achievement of management objectives and forest sustainability.	R.P.F.; 16 years of forestry experience including forest management and operational planning; auditor on 12 previous Independent Forest Audits.
Mr. John Long	Silviculture Auditor	Assess silvicultural planning and operations; assist in assessment of achievement of management objectives and forest sustainability.	R.P.F.; experience with seven recent IFAs; is a Certified ISO 14001 EMS Internal Auditor; extensive hardwood management experience on private and Crown land; developed guidelines for tree marking on the Nipissing Forest; supervised aerial spray program; supervised silviculture program and monitored harvests for large and small licensees.
Ms. Susan Jarvis	Modeling Auditor	Review SFMM strategic planning; assist in assessment of achievement of management objectives and forest sustainability.	R.P.F.; experience with 13 recent IFAs; extensive involvement in numerous FMPs including responsibilities for strategic planning; training in ISO 14001; completed an ISO 14000 Environmental Management Systems Essentials Course; reconciled wood flow data from management units to regional pulp/paper/saw mills; short-term wood supply analysis for the Northwestern Region.
Ms. Terri Dawyd	Public Consultation & Aboriginal Involvement Auditor Audit Secretariat	Assess various components including public consultation and Aboriginal involvement in forest management planning, elements of forest management planning, system support, monitoring, and contractual obligations; provide general support including logistics, evidence gathering and report development.	H.B.Sc.F. *candidate*; 7 years of forestry experience including technical field work, Aboriginal forestry project manager; served as Secretariat on four previous Independent Forest Audits.

APPENDIX C – INDEPENDENT FOREST AUDIT GUIDING PRINCIPLES

Principle1: Commitment
Commitment is reflected in vision, mission and policy statements of the company and adherence to legislation and policies. Vision and mission statements are intended to provide long-term guidance for the organization. Policy statements reflect how the organization's vision and mission will be achieved. These statements must be reflected in the day-to-day operations of the organization.
Principle 2: Public Consultation and Aboriginal Involvement
The process of sustainable forest management planning, implementation and monitoring must be conducted in an open consultative fashion, with the involvement of the Local Citizens Committee, Aboriginal communities, and other parties with an interest in the operations of the forest management unit.
Principle 3: Forest Management Planning
The forest management planning process involves input from all members of the planning team as well as public consultation and Aboriginal involvement to describe the current forest condition, values and benefits to be obtained from the forest, the desired condition of the forest in the future, and the best methods to achieve that goal. Planning requirements have been established which must be followed by all forest management units.
Principle 4: Plan Assessment and Implementation
Verification of the actual results of operations in the field compared to the planned assumptions and planned operations is required to be able to assess planning as well as the effective achievement of plan objectives and compliance with laws and regulations.
Principle 5: System Support
System support concerns resources and activities needed to support plan development and implementation so as to achieve the desired objectives. The organization's human resources and information management systems must support sustainable forest management.
Principle 6: Monitoring
Monitoring programs must be developed and implemented to assess compliance and effectiveness of operations in relation to the FMP, laws and regulations. Operations must be reported regularly and reporting must examine the effectiveness of these operations in achieving management objectives.
Principle 7: Achievement of Management Objectives and Forest Sustainability
Periodic assessments of the forest management unit operations must be made in order to determine whether management objectives, including forest sustainability objectives, are being achieved. This includes comparing the values of the planned indicators against the actual values and assessing the reasons for any significant deviations.
Principle 8: Contractual Obligations
The licensee must comply with the specific licence requirements. Specific requirements, when relevant to MNR, must be followed.

APPENDIX D – LIST OF ACRONYMS

AHA	available harvest area
AOC	Area of Concern
AR	Annual Report
AWS	Annual Work Schedule
CFI	Continuous Forest Inventory
CFSA	Crown Forest Sustainability Act
EA	environmental assessment
FFTC	Forestry Futures Trust Committee
FIM	Forest Information Manual
FMA	Forest Management Agreement
FMB	Forest Management Branch
FMP	Forest Management Plan
FMPM	Forest Management Planning Manual
FOIP	Forest Operations Information Program
FOP	Forest Operations Prescription
FRI	Forest Resources Inventory
FTG	free-to-grow
GIS	geographic information system
HPA	high priority aspect
HPCH	high potential cultural heritage
IEA	individual environmental assessment
IFA	Independent Forest Audit
IFAPP	Independent Forest Audit Process and Protocol
KBM	KBM Forestry Consultants Inc.
LCAC	Local Citizens Advisory Committee
MHLUP	Madawaska Highlands Land Use Plan
MNR	Ministry of Natural Resources
NDPEG	Natural Disturbance Pattern Emulation Guide
NRVIS	Natural Resource Values Information System
NSR	not sufficiently or satisfactorily restocked or regenerated
ODAM	Ontario Disturbance Agglomeration Model
OVFI	Ottawa Valley Forest Inc.
RBT	resource-based tourism
RPF	Registered Professional Forester
RPFO	Report of Past Forest Operations
RSA	Resource Stewardship Agreement
SEIM	Socio-Economic Impact Model
SEM	Silvcultural Effectiveness Monitoring
SEMMO	Silvicultural Effectiveness Monitoring Manual
SEV	Statement of Environmental Values
SFL	Sustainable Forest Licence
SFM	sustainable forest management
SFMM	Strategic Forest Management Model
SGR	Silvicultural Ground Rules
SMA	Selected Management Alternative
TAR	Comparison and Trend Analysis of Planned versus Actual Forest Operations Report

APPENDIX E – SUMMARY OF INPUT TO AUDIT PROCESS

General Public/Other Stakeholders

Newspaper ads were published in eight area newspapers prior to the pre-audit meeting advising the public of the upcoming audit including the *Arnprior Weekender, The Renfrew Mercury Weekender, The Pembroke Daily Observer,* the *North Renfrew Times, Petawawa Post, Barry's Bay This Week,* the *Cobden Sun,* and *The Eganville Leader.*

KBM also prepared a one page mail-out survey to solicit public input to the audit process. The survey, in addition to a general letter informing contacts of the audit, was mailed to all businesses and organizations, and a representative sample of one-third of the individuals listed in the Forest Management Plan (FMP) mailing list (as provided by MNR Pembroke District). This list includes tourist operators, private land owners, trappers, baitfish licence holders, bear management area holders, local municipalities and government agencies, independent loggers, logging contractors, shareholders and other special interest groups. The survey was also available to the general public on the KBM website (www.kbm.on.ca).

A total of 24 responses were received from the public as a result of either the newspaper ads or the survey. All comments and applicable audit team responses are summarized in the following table.

	Comment or Concern	Audit Team Response
1	Good to excellent management practices occurring on the Ottawa Valley Forest. Respondent is opposed to road decommissioning through culvert and/or bridge removals, abandonment, and restrictions in remote tourism zones, but this is not a problem on the Ottawa Valley Forest.	None required.
2	No input provided.	None required.
3	Indicated that OVFI operates in a very professional manner with communication being one of its strengths.	None required.
4	Respondent has made comments in the past but none in the past five years.	None required.
5	Respondent indicated that MNR was contacted in the past with positive results.	None required.
6	Respondent is familiar with Clara Twp., Renfrew Co., and has experience only good forest management practices.	None required.
7	Concerned with the shelter-wood management practices used in white pine dominated stands and the susceptibility to blowdown.	Shelter-wood management practices viewed in the field.
8	No input provided.	None required.
9	No input provided.	None required.
10	Respondent was concerned with timber being given to only one company.	The SFL is held by a co-operative made up of a number of companies.
11	Respondent indicated that they have contacted OVFI in the past and were satisfied with the response.	None required.
12	Commented on a lack of communication through MNR between recreational users and logging operations. Believes more consideration should be given to the recreational users of the forest. Indicated that the local snowmobile clubs are the sole maintainers of the trail system with little or no cooperation from any other user group.	MNR met and surpassed communication requirements. Additional communication to public regarding salvage operations. MNR attempted to secure a representative of the snowmobile association to join the LCAC without success.
13	Respondent indicated that they have contacted OVFI in the past and were not satisfied with the response, and are not satisfied with "the whole system in general".	None required.

	Comment or Concern	Audit Team Response
14	Comments provided regarding concerns over littering in the bush they believe is left behind by logging operations. Respondent indicated that they have not contacted forest mangers with concerns.	No industrial garbage seen left in the field during field visits.
15	Respondent indicated that they have contacted both MNR and OVFI in the past with positive results and states that OVFI does good work.	None required.
16	Comment that precautionary principle should be applied to all AOCs, including provincial park boundaries and access in and near provincial parks.	AOC's determined to provide adequate level of protection.
17	Respondent deals with OVFI on business matters and indicated that they are great to work with. Also commented OVFI staff on their involvement in operations, including monitoring.	None required.
18	Respondent identified the southeast portion of Renfrew Co. Twp. and the Greater Madawaska as areas where OVFI is carrying out good management practices. Also commented that road building and timber harvest have been carried out with regard for the environment.	None required.
19	Commented on the good job being done by OVFI in managing the forest. Also commented on the red tape and regulation that is killing the forest industry.	Audit team reviewed various process requirements.
20	Respondent feels there are too many roads being built and not enough decommissioning of roads, resulting in loss of habitat, disruption to wildlife patterns, and difficulty for COs to enforce game laws. Also commented on their disappointment about an MNR decision to allow a particular snowmobile route to be built (that was presented to the public in an open house). Respondent felt that MNR should not have allowed anther trail to be built.	The nature of the silviculture systems used on the forest requires an extensive road network (returning to blocks multiple times). Snowmobile route issue out of scope of audit.
21	Provided positive comments on operations that took place in Matawachan Twp. around their camp.	None required.
22	Respondent indicated that they have never contacted forest managers in the past with concerns, but did comment on slash and debris left over after cutting suggesting that the pieces be cut shorter to speed up the decomposition process.	Audit found no issues with utilization.
23	Respondent highlighted areas along the Achray Rd and around the Dacre area. Indicated that they [OVFI?] host public tours of the forest and provide field placements to high school students, stewardship rangers, and Algonquin Forestry students.	None required.
24	Respondent concerned with certain harvesting practices, specifically harvesting right up to a highway, excessive logging damage, and excessive slash. Also concerned with a former pine stand on North Cameron Road that was clear cut, burned, planted and sprayed – felt that this treatment was "severe".	Determined that comments were specific to activities that did not occur on the Ottawa Valley Forest.

Local Citizens' Committee

Letters were mailed to all current (and some past) members of the LCAC to notify them of the audit and invite their input. Members of the audit team met with LCAC members present at their meeting of September 29, 2008 to discuss their involvement in the development of the Ottawa Valley Forest 2006-11 FMP, whether in their view the LCAC has achieved its purpose, and if there are areas where the LCAC may be improved. Two members of the LCAC also accompanied the auditors for one day each during the field visit.

LCAC comments are included where appropriate in Section 3.2.1.

Aboriginal Communities

A letter was mailed to the Chief and/or comparable representative of each of the Aboriginal communities on the contact list provided by MNR Pembroke District inviting them to participate in the audit. The letter

explained that their input was welcomed and encouraged them to contact KBM if they wished to participate in the audit or if they required more information before making a decision. KBM did not receive any responses to the letter.

Through email and follow-up phone calls KBM was able to speak with a representative of the Bonnechere Algonquin First Nation, and the Algonquins of Pikwakanagan's economic development corporation, Makwa Economic Development Corporation Inc. Contact was made with the representative of the Algonquins of Greater Golden Lake who decided not to comment.

Comments of Aboriginal community representatives are included where appropriate in Section 3.2.5.

Overlapping Licensees, Contractors and Commitment Holders

Personal interview was held with the forester at Makwa Economic Development Corporation Inc. (Algonquins of Pikwakanagan). A telephone interview was also held with Grant Forest Products.

SFL Holder

Personal interviews were held with the General Manager, the Planning Forester, the Operations Forester, the GIS/Data Tech person, the Senior Compliance Technician, and the Administrative Assistant. OVFI staff also accompanied the audit team on each field day. The auditors appreciate OVFI's efforts in providing the auditors with information in a organized and timely manner as requested, particularly the comprehensive field books which allowed the auditors to make informed assessments on-the-spot while in the field.

Ministry of Natural Resources

Personal interviews and/or input were provided by the District Manager, Area Supervisor, two Management Foresters, two Management Biologists, the Forestry Technical Specialist, Resource Management Technicians, and the Resource Liaison Person. MNR District personnel also accompanied the audit team in the field each field day. The audit opening and closing meetings were attended by various MNR District personnel, including the District Manager.

A representative from the MNR Forest Management Branch also accompanied the audit team on one field day and participated in the closing meeting via conference call.

A representative of the Forestry Futures Trust Committee attended one field day and also attended the closing meeting.

KBM FORESTRY CONSULTANTS INC.
2008 INDEPENDENT FOREST AUDIT
PUBLIC SURVEY

Every five years, as part of the Province's responsibility for resource management in Ontario, the Ministry of Natural Resources (MNR) contracts firms to evaluate forest management activities on Crown lands. KBM Forestry Consultants Inc. of Thunder Bay, Ontario has been engaged by the MNR this year to conduct an independent forest audit of the Ottawa Valley Forest **for the period April 1, 2003 – March 31, 2008**.

As part of our evaluation, we would appreciate your input as a member of the public with an interest in forest management on the Ottawa Valley Forest. If you have comments related to forestry activities during the five-year period April 1, 2003 to March 31, 2008, please complete and submit this form (please see back of sheet for more information on the audit process).

KBM provides this opportunity to comment on the Ottawa Valley Forest audit, under the authority of Ontario Regulation 160/04 made under the Crown Forest Sustainability Act, 1994. Any personal information provided will be used solely by the audit team as input to the Ottawa Valley Forest Independent Forest Audit. Any questions regarding the collection, use, and retention of the personal information can be directed to Rod Seabrook, Lead Auditor at 807-345-5445 ext. 261 (email: rsea@kbm.on.ca) or to the company address indicated below.

Name: *(optional)*

Tel. and/or email: *(optional)*

What is your interest in forest management on the Ottawa Valley Forest?

Recreation ☐ _____
Employment ☐ _____ (e.g. forestry, tourism, etc.)
Conservation ☐ _____
Other ☐ _____

Can you identify any specific locations or activities on the Ottawa Valley Forest that illustrate good **OR** poor management practices, and that the audit team should be aware of in conducting their evaluation? Please provide specific details.

Have you ever contacted forest managers with comments or concerns during the 2003-2008 audit period?
☐**Yes** ☐**No** Whom did you contact? _____
(e.g., local MNR, Ottawa Valley Forest Inc.)

If Yes, were you satisfied with the response? ☐**Yes** ☐**No** If you were not satisfied, why not?

Feel free to add any additional comments (use additional sheet if required).

6. Please indicate if we may contact you for more information. ☐**Yes** ☐**No**
(If Yes *please ensure that you have provided your contact information above.)*

Please **mail, email, or fax** the completed survey to the address/fax number below by **September 19, 2008**.
The survey can also be accessed through our website at www.kbm.on.ca

Although we cannot respond to everyone, we do take into consideration all comments received.
Thank you in advance for your input.

KBM Forestry Consultants Inc.
tdawyd@kbm.on.ca
http://www.kbm.on.ca
349 Mooney Avenue
Thunder Bay, ON P7B 5L5
Tel: (807) 345-5445 ext. 233
Fax: (807) 345-5858
Toll-free: 1-800-465-3001

INDEPENDENT FOREST AUDIT
Ottawa Valley Forest

KBM Forestry Consultants Inc. has been retained by the Ministry of Natural Resources (MNR) to conduct an Independent Forest Audit, consistent with the Crown Forestry Sustainability Act, on the management of the Ottawa Valley Forest.

The audit covers the **April 1, 2003 to March 31, 2008** operating period. **You are invited** to comment on the forest management activities on the Ottawa Valley Forest for this period of time. Please provide your comments by **Friday, September 19, 2008** to:

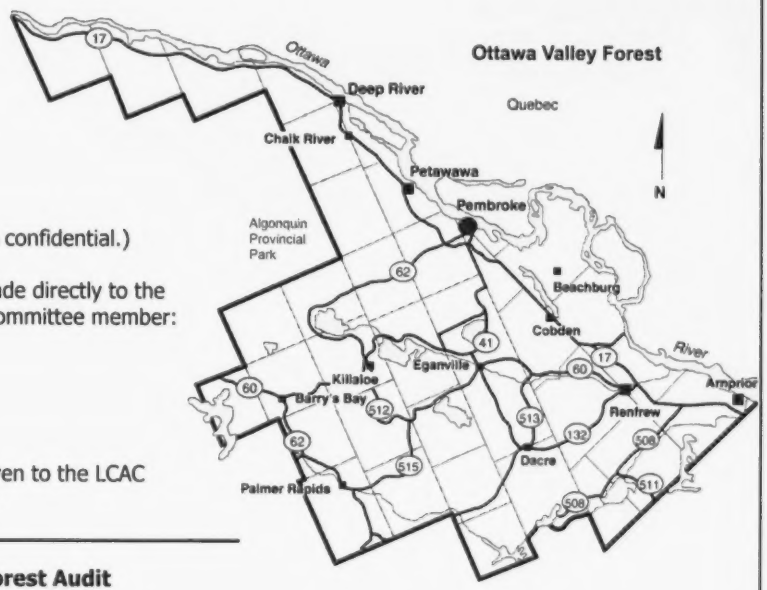
Terri Dawyd
KBM Forestry Consultants Inc.
349 Mooney Ave.
Thunder Bay, ON P7B 5L5
Email: tdawyd@kbm.on.ca
Tel: (807) 345-5445 ext. 233
Fax: (807) 345-5858
Toll-Free: 1-800-465-3001

(All correspondence sent to KBM is confidential.)

Alternatively, comments can be made directly to the following Local Citizens Advisory Committee member:

Robin Cunningham
Email: rcunning@nrtco.net
Tel: (613) 732-8402

(The privacy of any information given to the LCAC may not necessarily be protected).



Purpose of the Independent Forest Audit

The Purpose of the audit is to assess:

- compliance with the Crown Forest Sustainability Act,
- compliance with the Forest Management Planning Process,
- a comparison of planned versus actual forest management activities,
- the effectiveness of forest management activities in achieving audit criteria and management objectives,
- the effectiveness of previous audit action plans, and
- where applicable, a licensee's compliance with the terms and conditions of the Sustainable Forest Licence.

The six-member audit team will evaluate forest management planning and practices such as harvest operations, forest renewal activities, road construction and maintenance as well as opportunities for public input and Aboriginal communities consultation. The main objectives of the audit are to assess compliance with provincial laws and regulations as well as comment on the effectiveness and sustainability of forestry activities on the management unit.

In addition, the independent forest audit provides an opportunity to improve Crown land management in Ontario through adaptive management. The audits are conducted by consultants that are independent of the Ministry of Natural Resources and the companies being audited, and firms are selected in an arms-length process by the Forestry Futures Committee of Ontario.